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*Illustrated.

Locomotive Improvements and Operating Costs

The discussion of improvements in locomotives is very frequently passed over by transportation officers as being of interest only to representatives of the mechanical department. While this attitude may at times be justified, the outline of the results obtained by modernizing a Consolidation locomotive on the Kansas City Southern, which is given elsewhere in this issue, should be of direct interest, not only to mechanical department officers, but to all those who have to do with the movement of trains. The possibility of modernizing some of the older locomotives is a question that has been brought up on many occasions on different railways. There are thousands of locomotives, built within comparatively recent years, which are capable of much better results from a transportation standpoint, if some means could be found of increasing their capacity. The alterations made on the Kansas City Southern in a Consolidation locomotive, with only 33 sq. ft. of grate area, have resulted in marked improvements in those items which most directly affect the cost of conducting transportation, namely, fuel and water consumption, tonnage hauled and overtime paid to engine and train crews. While the changes made in this engine to accomplish these results are, of course, of special interest to mechanical department officers, their chief interest is from the standpoint of the cost of conducting transportation, and viewed from this point they indicate the possibilities of reducing transportation costs by modernizing many of the locomotives which are now being relegated to way freight, branch line and switching service.

Working Hours of Station Men

Massachusetts has an hours-of-service law which comes near being a freak. It is well calculated to make more trouble even than the federal law relating to telegraphers. It is Chapter 746, passed last year, and reads: "Employees in and about steam railroad stations designated as baggagemen, laborers, crossing-tenders and the like, shall not be employed for more than nine working hours in ten hours' time: the additional hour to be allowed as a lay-off. . . ." At Worcester, January 21, the grand jury, in the Superior Court, returned indictments against the Boston & Maine for violation of this law. Both here and in the federal law there is evidence of some good intent, but if the main purpose of their authors had been to cause confusion and needless expense, they could hardly have succeeded better than they did. Freight houses employing dozens of laborers may often be classed as "stations" and, perhaps, ought to be so classed in nearly every case; yet this Massachusetts law does not seem to be intended to apply to such men. The suit against the Boston & Maine is designed, presumably, to get the statute construed. Why should baggagemen need more time off than telegraphers, clerks, switchtenders and signalmen? What meaning can be found in the word "like," as used in the statute? Why should crossing-tenders near a station be favored above those a half mile away? An officer of the Boston & Maine tells us that relief crossing-tenders, required by this law, are now costing that road $7,800 a year. It is probable that a fraction of this sum, paid to the "first trick" watchmen, would satisfy them far better than the time off which is allowed them, and would afford the public equally satisfactory service. In short, the law appears to be a shining illustration of the way in which labor leaders "work" the legislatures for the mere pleasure of conquest, with little regard for the interest either of the public or the alleged "laboring men."

Correction of An Erroneous Statement

In its issue for January 15, page 80, the *Railway Age Gazette* published an editorial entitled "The Suspension of Advances in Rates." In the course of this editorial the following statements were made:

> The coal originating railroads leading into St. Louis and East St. Louis gave notice in January, 1913—just two years ago now—of an advance in coal rates from Illinois territory to the St. Louis group, effective on April 1, 1913. The commission suspended the tariffs until July 30, 1913, and later to January 30, 1914, when its statutory authority of suspension expired. The case was heard on December 1, 1913, and argued in February, 1914; and, at the request of the commission, on the ground that it was as yet unable to dispose of the case, the rates were further suspended until March 31, 1914. Then, on the ground that it could not decide the case before the summer recess the commission asked that the rates be further suspended until November 1, 1914, which also was agreed to. On still another request from the commission the rates were still further suspended until January 1, 1915; and now the commission has asked for another postponement to November 1, 1915!

The information on which these statements were based was given to us in writing by a railway officer. Secretary McGinty

of the Interstate Commerce Commission subsequently wrote us saying that the statements which we have quoted had been considered by the commission in conference, and that he had been "directed to say that the statement to the effect that the carriers had been called upon to suspend the coal rates into St. Louis until November 1 (1915) is wholly incorrect and without foundation." We communicated the substance of Mr. McGinty's letter to the railway officer who had called our attention to the St. Louis case, and he replied that the date "November 1" in his communication to us should have been "February 1," the mistake being due to an error in copying. Inquiry of Secretary McGinty has brought confirmation of the statement that the commission did ask for a further postponement to February 1, 1915. We make this statement in justice to all parties concerned.

"BUY IT NOW"

SOME time ago the Agricultural Publishers' Association, publishers of the principal farm papers of the country, began a campaign to get the farmers to commence buying at once all the things they would need within the next few months. The movement extended to other lines of business; and now an attempt is being made to get all classes to "buy it now."

The railways ought to be included in the movement. The traffic and earnings of all roads are comparatively small at present. Many companies buy as much as they can when their earnings are large and as little as they can when they are small. There are poor roads and rich roads. The poor roads have to follow this policy because it is only when their earnings are up to or above normal that they can buy much. For rich roads to follow the practice is bad business and bad citizenship.

Regarding the matter from a narrow, selfish standpoint, it is bad business for a rich road to concentrate its buying and its improvement work in years of large earnings. All kinds of supplies and equipment can be bought and work done cheaper in the lean than in the fat years. The prices of most kinds of equipment and supplies are lower, the wages of some kinds of railway labor are lower, and all kinds of labor are more efficient, which is equivalent to lower wages. Every railway man knows these things. Every railway men also knows there will be use in the good times, which are sure to come, for many improvements in and additions to facilities that can be made in the bad times. Why, then, do so many railways which could spend more money to advantage in periods of light business postpone expenditures until traffic gets heavy and lines and yards are congested?

Largely, no doubt, because this is the fashion. Another reason is the widespread and chronic desire to make a paper showing. Many roads are dominated from Wall street, and many Wall street bankers don't know enough about railroading to appreciate the advantage of doing work when it can be done cheapest. They want a certain margin maintained between income and outgo in bad as well as in good times, and don't realize that both the stockholders and the public often lose by having good paper showings made in hard times. There probably is hardly a strong railway in the country which will spend in the calendar year 1915 as much as its permanent interests would warrant.

There is another point to be considered besides the effect produced on the individual road's prosperity by its policy of making expenditures. The policy of doing almost nothing in hard times and a great deal in good times causes violent alternations of feast and famine in the railway supply market and the railway labor market. One year the supply and equipment concerns are glutted with orders. The next year, perhaps, they will have hardly any. One year the demand of the railways for unskilled labor exceeds the supply, and they boost wages greatly in the unskilled labor market. The next year their demand falls off heavily, resulting in thousands of men being thrown out of work. The bigger a concern or an industry is the larger are the effects its business policy produces on economic and industrial conditions in general. Individual railways and the railway system as a whole have become so big that the violent fluctuations from year to year in their expenditures are a demoralizing influence on business of all kinds.

There are several strong roads which already follow the practice of making extensive improvements in periods of light traffic; and many more would do so if their managements were controlled by sound business considerations and proper regard for the public good.

The injunction to "buy it now" and the complementary injunction to "do it now" ought to be acted on within the coming months by every strong railway in the country. Neither good business nor public spirit dictates that they shall buy or build anything they will not need, but good business and public spirit both demand that they shall buy and build many things they are certain to need. If those who finance railways do not recognize these facts the executive officers should carry the message to Wall street.

AN OUTRAGEOUS APPEAL TO THE PLAIN PEOPLE

THE mistrust of the intelligence and fairness of the plain people shown by the higher classes in the United States threatens the peace of the nation and the perpetuity of free institutions. The down-trodden railroads of Pennsylvania and New Jersey ventured to appeal regarding the train crew laws to the plain people of those states. The Brotherhood of Railroad Trainmen, whose members belong to our intellectual aristocracy, and our political oligarchy, has taken great offense at this attempt of the roads to draw the rabble into the controversy. It has issued a statement denouncing the course of the companies, in which it says: "Briefly stated, their (the railroads') announcement declares they intend to present the question of the repeal of the full crew laws to the public; but why, is left to conjecture. The power to repeal is vested in the legislature and . . . . the average citizen knows about as much concerning the practical operation of a railroad as the man in the moon knows about building sewers."

Plainly, the railroad presidents and general managers don't know anything about the practical operation of a railroad. Neither do the public utility commissions, to which the railroads would be glad to have the question referred. And, manifestly, the plain people don't know anything about it, either. The members of the legislatures are the repositories of all the wisdom on the subject. They have just been snatched from the lawyer's office, the store, and the plowhandle, where they have had opportunity to learn everything about the operation of a railroad. Furthermore, they have direct access to the inspired lips of the paid lobbyists of the Brotherhood of Railroad Trainmen, and can learn from them not only all they need to know about how to operate a railroad, but, what is more important, all they need to know about how to get the millions of votes the Brotherhood controls.

All this is plain as a pikestaff. And it is, of course, most pernicious for the railroads and the people to get together and talk things over. It is so much easier for the labor lobby and other altruistic interests to get what they want when the people are saying, "To the bow-wows with the railroads!" and the railroads are saying, "The public be d———!" If the people and the railroads get too close together they may put both the lobbyist in the labor organization and the demagogue in the legislature out of a job, which would be sad.

But remember that, after all, it is the railroads that are being regulated and the railroads and the people that together are footing the bill, and be patient with them if they cry out when they are gouged unusually hard or are treated with the scorn that they so richly merit. And don't carry the gouging and scorning too far. The error of gouging the plain people too much, and treating their wishes and opinions with too open contempt, is one which oligarchies ever have been prone to commit, and always in the long run with unhappy results for the oligarchies.

AMERICAN RAILWAY MECHANICAL ASSOCIATIONS

AMERICAN railroads enjoy much more free interchange of ideas and information regarding their individual practices in the design and maintenance of cars and locomotives than do the railroads of any other country. We have various railway mechanical associations, composed of men representing the majority of American railways, which meet annually for the sole purpose of discussing their problems in an endeavor to find practical and economical solutions. As a natural result there is found a certain uniformity in locomotive and car construction and in shop practice which, of course, is of economic value to the railways in particular and to the country as a whole.

English roads, on the contrary, are very conservative in giving information to the public, or even to each other, and, in consequence, nearly as many special designs are found on them as there are roads. Their locomotives represent distinctly the ideas of the individual chief mechanical officers to such an extent that whenever such men are mentioned the mind will simultaneously recall their special hobbies in design. Their purpose seems to be to have something distinct from other roads. Cases have been known where, with a change in the administration of the mechanical department, individual features, such as compounding, have been entirely eliminated at a large cost to the roads.

In this country we have ten railway mechanical associations, of which the Master Car Builders' and Master Mechanics' associations are the most important. Their work is quite thoroughly understood and is considered authoritative by the railway managements. The field has so broadened since their inception, some 48 years ago, that they are now unable to consider the numerous detail problems that they once did. Naturally this work has been taken up by other associations which are composed of subordinate mechanical officers, and the justification for the existence of these associations becomes more apparent each year. A brief review of their proceedings for the past year will indicate in some degree the scope of their work.

Pre-eminent in the proceedings of the Traveling Engineers' Association are the papers on "Efficient Operation of Locomotives," "Locomotive Air Brake Equipment," and "Practical Chemistry of Combustion." These papers with their discussions are text books in themselves, containing information of material value to railway mechanical men. Papers were also presented on mechanical stokers, smoke prevention and speed records which give results obtained in actual practice. This association has also compiled examination questions and answers of recognized merit for locomotive engineers and firemen.

At the convention of the General Foremen's Association detailed papers were presented on engine house efficiency, autogenous welding and the maintenance of air brakes, all live subjects to the members of the association. The Air Brake Association considered the advantages to be derived from caboose gages, and strongly recommended their use as a profitable protective feature, especially on long freight trains. The efficiency of the foundation brake gear was also discussed, some members showing how they had increased the braking power by simply stiffening some of the elements in the gear. Regarding air brake hose, it was believed that less failure would occur and a more efficient service would be obtained if a specific time limit for the life of the hose were adopted. The proper distribution of empty cars throughout a long train was shown to have materially reduced the possibilities of break-in-twos.

The Master Boiler Makers' Association presented valuable information regarding the use and maintenance of combustion chambers, showing the advantages as well as the disadvantages from a maintenance standpoint. The questions of the effect of bad water and the use of oxy-acetylene and electric welding on boilers were also considered, the results of actual practice being given. An especially noteworthy feature of the Tool Foremen's Association has been its investigations of standard tools. In 1913 standard taps were adopted, and last year a discussion of the standard reamer was begun, and the standards are to be adopted at the next convention. The subjects discussed last year included shop kinks and special tools, milling cutters being especially considered. Marked advances have been made by some roads in developing these special tools and valuable information may be obtained from the discussions on this subject. Other reports considered related to grinding, machine tool repairs and the distribution of shop tools.

The Master Blacksmiths' and the Master Painters' associations both deal with problems of especial interest in their fields, the former being particularly interested in the new methods of welding and the handling and heat treating of the special steels. The painter's chief problem at the present time is the proper protection of all-steel equipment, and for the past few years the experiences of the different roads have been presented at the conventions, with material benefit to all the members. This association maintains a test committee that is to be commended for the work it has done. Exposure tests of paints and varnishes are made each year in different parts of the country, and the members are given the results of the tests at the conventions.

The Chief Interchange Car Inspectors' and Car Foremen's Association meets annually to study and discuss the M. C. B. rules of interchange, and in many cases finds opportunities to clear up difficulties which have arisen from misunderstandings of these rules. In some respects this association is handicapped by not having an authorized member of the M. C. B. Association present at its meetings to guide the members in placing correct interpretations on the rules, especially those that have been adopted at the preceding M. C. B. convention.

In addition to the information obtained from the convention proceedings, great benefits are derived by those attending the conventions from the chats they have with their fellow members. Meeting and conversing with others handling similar problems in different ways has a very broadening effect, giving the members new ideas and freshened ambitions which are surely reflected in their work. In order to make the mechanical conventions entirely successful, representatives of all the roads should be present with definite instructions to add what information they can to the subjects under consideration and to learn all that is to be learned from their fellow members. By doing this the good ideas of the several men will be collected in a concise form for the benefit of all the members, and consequently for the benefit of the roads they represent.

IMPROVEMENTS IN HANDLING RATE SUSPENSION CASES

THE Interstate Commerce Commission has sent out two circular letters regarding the suspension of advanced rates which should result in an improvement in the administration of the law pertaining to this subject. They will do so if the shippers and railways give the commission co-operation.

One of the circulars is addressed to the public. It calls attention to the fact that, while the law authorizes the commission to suspend proposed increased rates, it contemplates that "the power will be exercised with judgment and due consideration for circumstances and conditions." It is necessary, if the commission is to exercise a sound discretion, that protests against advances be filed a reasonable time before they are to go into effect. In many cases this has not been done. The commission, therefore, requests that protests be made as early as possible, and gives warning that "it may be necessary to deny suspension in instances in which the protest is not filed with the commission at least ten days prior to such effective date."

The second circular is addressed to traffic officers, tariff issuing officers and agents of carriers. "The commission," it says, "desires not only to deal with these matters justly in the first instance, but with due consideration for circumstances, to finally dispose of investigation and suspension cases at the earliest practicable date following the suspension." To this end it requests that, when tariffs carrying increased rates are filed, the proper

officer of the carrier shall present to the commission a concise statement of the increases proposed, showing in a general way the measure thereof and the reasons therefor.

The suggestions in both circulars are obviously reasonable. The initiative regarding the suspension of rates should be taken, not by the commission, but by the shippers and other persons affected. Apparently, many have proceeded on the assumption that it is the commission's duty, or at least its practice, to suspend every advanced rate against which there is a protest and many against which there is none. This is not its duty, and is not, and ought not to be, its practice. Some real investigation on the merits ought to be made before any advance, small or large, is suspended, and in order that this may be done a considerable time should elapse between the filing of protests and the effective date of the rates protested.

The commission cannot require the railways to inform it as to the reasons and extent of proposed advances in rates except at a formal hearing. But it is desirable that before the commission decides whether it will suspend a tariff it shall have before it information which will enable it to form a reasonable judgment. It cannot have such information unless the carriers furnish it; and the sooner the carriers furnish it the more intelligently can the commission consider the questions involved. There doubtless have been numerous cases where suspensions of advances would have been avoided if the carriers had furnished to the commission on filing their tariffs concise but frank statements of the extent of and reasons for the proposed advances.

The issuance of these circulars is a gratifying indication of a disposition on the part of the commission to improve its work in connection with the suspension and investigation of proposed advanced rates; and it is to be hoped that both the shippers and the carriers will respond in the right spirit.

THE PANAMA RAILROAD

IN the early days railways used to supersede canals. The Panama Railroad, however, is now about to take the figuratively backward step of being superseded by a canal. The United States Government has controlled the Panama Railroad Company by stock ownership since May, 1904, and the railroad in these years has progressed wonderfully, but a fair comparison of its operations with those of the average privately owned railway furnishes no argument for government ownership.

The railroad at present operates 62 miles of line, 48 miles of which is main line, mostly single track, paralleling the Panama Canal from Colon to Panama. The total trackage is 150 miles, of which 60 miles is at terminals. The company's operations for the past few years have been varied. In addition to acting as carrier for the Isthmian Canal Commission, the railroad has also conducted a local "commercial" service in the canal zone and a commercial service across the isthmus for both passengers and freight. It has also engaged in the transportation of passengers and freight by sea from New York and other ports, and has constructed a number of docks at the entrances to the canal and expects in time to derive a large revenue from them.

The annual report for the fiscal year ending June 30, 1914, does not show the effect that the opening of the canal will have on the railway's revenues. That the company's business will suffer greatly from the diversion from rail to water-borne transportation across the isthmus is, however, a foregone conclusion. The railroad has already cancelled the through billing arrangements with its foreign and domestic connecting steamship lines on both the Atlantic and Pacific, and the effects on the earnings of the company will show decidedly in next year's annual report.

In 1914, the company's operating revenue from all classes of service was $6,823,000, an increase of $72,000 over the $6,751,000 of 1913. The operating expenses, on the other hand, were $4,682,000 as compared with $4,700,000, a decrease of $18,000. The net operating revenue of $2,140,000 was thus $90,000 greater than in 1913, and the ratio of expenses to earnings was 68.63 and 69.63 per cent, respectively, in 1914 and 1913. There was also other income from interest and exchange and rentals of $277,000, making a total of $2,417,000 from which deductions were made of $93,000 for rentals of terminals and terminal offices and $21,000 for the government income tax so that the total net income for the year was $2,303,000. This is the amount carried to the credit of profit and loss.

The total railroad revenue of $4,567,000 was $32,000 greater than in 1913 and was made up of the following items: total revenue from transportation, $3,965,000 as compared with $3,942,000 in 1913; revenue from operations other than transportation, including revenue from station and train privileges, freight and baggage storage, telephone and telegraph service, etc., $30,000, or $9,000 more than in 1913; harbor terminal revenue, $445,000 as compared with $436,000 in 1913, and other operating revenue of $127,000, $74,000 less than in 1913. The railroad's total freight revenue traffic was 1,544,252 tons, a decrease of 404,963 tons, or 20.78 per cent as compared with the previous year. The total revenue from this traffic, however, was $2,846,000, an increase of $61,000 or 2.18 per cent, the increased revenue with a smaller tonnage being due to the loss of a large amount of cement and other low grade traffic and an increase in traffic of higher grade. The passenger traffic showed an increase in the number of passengers carried but a decrease in the amount of revenue received. The total number was 3,124,974, or 7.14 per cent more than in 1913, and of this total 2,231,563 were second class passengers. The revenue received was $764,000, a decrease of $62,000 or 7.55 per cent. The operating expenses of the railroad in 1914 were $2,741,000 and in 1913, $2,770,000. the ratio of expenses to earnings in the two years being but 60.02 and 60.24 per cent respectively. The net revenue from the railroad was $1,826,000, approximately equal to the $1,829,000 of 1913.

The steamship line had a total revenue in 1914 of $2,255,000, or $104,000 greater than in 1913. The expenses, on the other hand, were $1,941,000 as compared with $1,930,000 in 1913, and the net revenue was $314,000 or $93,000 greater than in 1913. The per cent of expenses to revenue was 86.06 and 89.70 in 1914 and 1913 respectively. The steamship line during nearly the entire fiscal year operated two ships which it owned and four which it chartered. It is important to note, however, that the expenses of operation as given include no item for insurance nor any for charter of ships.

The Panama Railroad Company on June 30, 1914, had total capital assets of $22,474,000. Its working assets amounted to $6,655,000, of which $3,804,106 was cash. The total stock outstanding was but $7,000,000, but there was also a capital liability of $3,247,000 representing the company's indebtedness to the United States Government. This amount still remains unchanged from the previous annual report. The company is, of course, in an exceedingly strong financial position; its total surplus on June 30, 1914, was $17,534,000.

This railroad is indeed in an enviable position among railroads. For one thing it pays practically no taxes. It owes no allegiance to the Interstate Commerce Commission, and can set its own rates and use its own system of accounts of its own free will. The fact has been enlarged upon so often that it is almost unnecessary to treat of the matter again. It is interesting, nevertheless, to see why the Panama Railroad should be as successful as it is. In the fiscal year ended June 30, 1914, the total ton mileage of revenue freight carried was 66,213,890 tons, a decided decrease from 80,641,423 of 1913, largely due to a drop in the ton mileage of Panama Canal freight from 43,777,053 to 27,801,469. The average revenue per ton per mile in 1914 was no less than 4.35 *cents*. In 1913 it was 3.48 *cents*. The average for all roads in the United States in 1913 was but 7.29 *mills*. It is not strange, then, that the road should have a freight revenue per mile of road of $46,748, whereas the average for all roads in the United States in 1913 was but $7,962. The total passenger mileage in 1914 was 36,140,440. The average distance each passenger was carried was only 12 miles, which to some extent explains why the number of passengers in each train should have been 141. In 1913, it was 188. In the United States in 1913 it was but 55.

The average revenue per passenger per mile was 2.11 cents in 1914 and 2.37 cents in 1913 as compared with a similar figure for the United States in 1913 of 2.008 cents. The passenger revenue per mile of road in 1914 was $18,110. The railroads of the United States in 1913 obtained a similar revenue of but $3,301.

It has been stated above that the operating revenue from the railroad alone in the fiscal year ending June 30, 1914, was $4,567,000; that the operating expenses were $2,741,000, and that the net revenue, or the difference, was $1,826,000. It is worth the trouble, however, to examine the latter figure closely and to see what would become of it if it were treated as similar figures are treated on private roads. First, there would be deductions for taxes. The taxes paid by the railroads of the United States in 1913 amounted to over 4 per cent of their operating revenues. At this rate the Panama Railroad would have paid in taxes $183,000, which, subtracted from the net revenue given above, would leave a net operating income of $1,643,000. The isthmian line also does not have to allow for payments of interest or dividends. The value of the railroad alone (excluding the floating equipment) was on June 30, $21,480,000. Interest charges on this at three per cent, much less than United States roads have to pay, would be $644,000, which, subtracted from the operating income of $1,643,000, would have a surplus of only $999,000. Of the operating revenue $4,567,000, $2,846,000 was derived from the carriage of freight at a ton mile rate of 4.35 cents. This rate is almost *six times* as much as the average revenue of 7.29 *mills* per ton mile received by the railways of the United States in 1913. If the average rate per ton mile of the Panama Railroad had been *only three times* as great as that of the railways of the United States, or 2.19 *cents,* its freight earnings in 1914 would have been only $1,440,000, or $1,406,000 less than they were. These deductions for taxes and interest on the value of the railroad, and a reduction of the average freight rate to a mere *three times* as much as that paid in the United States, would have left the Panama Railroad with a deficit of $407,000, instead of the "surplus" shown on its books.

Furthermore, the Railway Mail Pay Committee has just called attention to the fact that besides receiving an average freight rate almost six times as great as that of the railways of the United States, the Panama Railroad is treated with the greatest generosity by the postoffice department. From the statement issued by the Railway Mail Pay Committee it appears that the Panama Railroad in the last fiscal year received more than $2.77 for each ton of mail carried one mile by it, which is 28 times as much as the average rate paid by the postoffice department to the privately-owned roads of the United States. The Railway Mail Pay Committee adds: "Had the Panama Railroad been paid at the average rate allowed the railroads of the United States, it would have received last year only about $9,000 for carrying the mails. It actually received $250,306. On the other hand, if the railroads of the United States last year had been paid the Panama Railroad rate, their receipts for carrying the mails would have been $1,557,000,000, or more than five times the total revenues of the postoffice department. They actually received $56,000,000, or about one-fifth of the department's revenues."

All of which indicates how fortunate it is for this government-owned road that it is not subject to the same burdens and restrictions as the privately-owned railways of the United States.

The following table shows the principal figures for operation as they are given in the Panama Railroad's annual report, but they are misleading unless they are qualified by the considerations just discussed, namely, the freedom from taxes and fixed charges and the high ton mile rate:

	1914	1913
Average mileage operated	62	62
Freight revenue	$2,846,103	$2,785,513
Passenger revenue	763,973	826,340
Total operating revenue	4,567,406	4,599,163
Maint. of way and structures	414,444	391,193
Maint. of equipment	464,467	470,824
Traffic expenses	16,926	13,852
Transportation expenses	1,396,210	1,427,401
Other expenses	449,439	467,040
Total operating expenses	2,741,486	2,770,310
Net revenue for operation	1,825,920	1,828,853

NEW BOOKS

Proceedings of the Master Car and Locomotive Painters' Association. Compiled and published by Alfred P. Dane, secretary of the association, Reading, Mass. 108 pages, 6 in. by 9 in. Bound in cloth.

This is a report of the forty-fifth annual convention of the Master Car and Locomotive Painters' Association, which was held in Nashville, Tenn. The convention considered the painting of steel equipment, with special attention to passenger car roofs. The question of sand blasting the steel before painting was also thoroughly considered, and among some of the members this practice found ardent support. The paint shop apprenticeship system, as in effect on the Delaware, Lackawanna & Western, was described in some detail. There was considerable discussion on the question of standard freight car lettering. As usual, the association also presented an interesting and instructive report on tests with paints and varnishes.

Proceedings of the American Railway Master Mechanics' Association. Compiled and published by Joseph W. Taylor, secretary of the association, Chicago, Ill. 1,045 pages, 6 in. by 9 in. Two volumes. Bound in cloth. Price, $5 per volume.

This year it was found advisable to publish the proceedings of the American Railway Master Mechanics' Association in two volumes, on account of the large amount of material presented. Volume I contains the full report of the convention with the exception of the report on Locomotive Headlights which, with its discussion, is published in Volume II. This report alone, with its appendices and discussions, occupies 377 pages of the proceedings and presents the results of the most exhaustive investigations ever made on locomotive headlights. In addition there are reports on Locomotive Stokers, Standardization of Tinware, Locomotive Superheater Tests, Code of Rules for Testing Locomotives and papers on Flange and Screw Couplings for Injectors, and tests of the Locomotive Superheater and Brick Arch. Volume I contains the constitution and by-laws, list of members, etc.

Heat-Treatment of Steel. Compiled by the Editors of Machinery. 278 pages, 6 in. by 9 in. Illustrated. Bound in cloth. Published by the Industrial Press, 140 Lafayette street, New York. Price $2.50.

During the past two decades developments have taken place in the processes involved in the building of machinery as well as in the materials of construction, which have produced many changes in the heat-treatment of steel. The introduction of high speed steel for cutting tools and the various alloy steels, the usefulness of which depends almost entirely upon proper heat-treatment, has made necessary the careful study of processes and has produced many remarkable changes in practice. In the preparation of this book it has been the purpose to place on record the modern methods of heat-treatment, and although largely descriptive in its dealing with the subject, the book will be found to contain much practical data of value to those who have to do with heat-treating operations.

The first chapter is devoted to a theoretical discussion of the effect of heat-treatment and a brief digest of the results to be obtained by various methods of treating carbon and alloy steels. In the following chapters the various processes of hardening, quenching, tempering, annealing and casehardening are described in detail, the text being amplified by numerous engravings showing the construction and methods of operation of the furnaces and other appliances. The application of the electric furnace to heat-treating operations is dealt with at considerable length and a chapter is included on the newly developed method of casehardening by carbonaceous gas.

A brief treatise is included on the methods used to measure the hardness of metals, and various types of hardness testing machines, developed in this country and abroad, are described.

The information contained in the book has been mainly compiled from articles published in Machinery and from the well known Machinery Reference Books, and it forms a very comprehensive treatise on a subject about which little of a practical nature has been written.

Letters to the Editor

A CARPING CRITIC

PITTSBURGH, Pa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

We had flattered ourselves that there were no longer any "two-faced" men in the railroad service; but look at the Chesapeake & Ohio's "Suggestions for Safety," on page 151 of your issue of January 22 reading: "Don't move hand car at all, without a man facing both directions!"

Anonymous letters are, of course, objectionable; but as this is neither a complaint nor a "grouch" the signature, for obvious reasons, is omitted. * * *

NOT MAKING FRIENDS

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I read with great interest the article entitled "Are You Making Friends for Your Railroad?" which appeared on page 129 of the *Railway Age Gazette* for January 22, 1915, and since reading it have had an experience on a suburban train entering New York City which brings out the value of the teachings of this article and the ill feeling that may be caused by practices of a contrary nature. I decided, on the occasion referred to, to take a later train than usual and on consulting a timetable, found that because of the day's being a holiday, several of the regular week day trains did not run. I judged, therefore, that the trains that remained would be amply supplied with cars and was much surprised to note, when the train which I decided to take pulled into the station, that it consisted of but four cars which were already crowded. As the train made four more stops, at each of which passengers were picked up, the occupants were soon packed into the cars in a way that would make a New York subway guard green with envy.

So far as I can see this condition was the result of poor judgment on the part of those in charge of the making up of the trains; but there does not seem any reasonable excuse for such poor judgment as was exercised in this case. If the general manager, or some other of the higher officers who are constantly endeavoring to keep this road in the good graces of the public, could have been on this train and heard some of the numerous comments that were made, they would realize that in order to make and keep friends a railroad should not confine its efforts in this direction to urging politeness on ticket agents and trainmen.

COMMUTER.

TWO PLANS FOR CAR POOLING COMPARED

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The proceedings of the Central and Western Association of Car Service Officers, recently published, contains the report of the Committee on Pooling Freight Equipment, which is to be discussed at the next meeting of the association which will be held on April 15. The report was made in November, 1914, so it may be presumed that the committee was not familiar with the car equalization agreement which went into effect between the International & Great Northern and the Sunset Central Lines on October 1, 1914, and which was discussed in your issues of January 15 and 29.

The Committee on Pooling Freight Equipment is made up of E. E. Betts of the Chicago & North Western; W. E. Beecham of the Milwaukee & St. Paul, H. G. Earl of the Chicago Junction, and T. H. Hervey of the Ann Arbor, so that the plan may properly be called the Central and Western pooling plan, and it is interesting to compare its features with those of the Texas equalization agreements.

The Central and Western plan is to cover box cars only. Other equipment is to be considered as "special" and subject to the car service rules as administered by the Commission on Car Service. The first of the Texas equalization agreements applies to absolutely all cars, so that it is practicable under this to even up a box car with a flat car, for instance. In making the second agreement, however, it was found necessary to except the "special fruit and vegetable cars" of one of the subscribers which apparently are to be handled under the car service rules. It seems quite logical that exceptions of this kind should be made.

Both plans contemplate agreements. The Central and Western agreement is to be "similar to the per diem rule agreement," which provides for termination on three months' notice. The Texas agreement allows termination on 30 days' notice. The provision for the furnishing of cars differs probably more in language than in effect. Under the Central and Western plan "each member must furnish the full number of units its maximum traffic requires." The unit alluded to is to be an 80,000-lb. box car, cars of smaller capacity being accepted in proportion to that capacity.

The Texas arrangement, as above, accepts car for car, simply providing that each subscriber may use as its own the cars of each other subscriber, and each shall undertake to supply an equal number of cars. The Texas agreement also provides that a subscriber may include as its own cars, those belonging to other railways when the authority of the owner is given.

Both plans contemplate settling for repairs on the basis of the present Master Car Builders' rules, although the Central and Western plan recommends certain changes in these rules.

It is when we come to the administration of the plans that we find the most difference between them. The Central and Western provides for the dividing of the continent into zones, each under the supervision of an Assistant Commissioner. These Assistant Commissioners are to report to the pool commissioner who is to be appointed by the American Railway Association and receive his instructions through the Executive Committee. The commissioner is to be given "authority" to move the cars so as to equalize them properly during the periods both of surplus and shortage. On this point the committee states that it would be practicable to introduce a pooling statement "provided sufficient latitude and power be conferred on a duly constituted board of competent jurisdiction."

The committee does not state, however, just what recourse the Commissioner would have in case his orders are disregarded, although in several places, as above, it states that he will "have authority."

The Texas plan provides for no Commissioners, Assistant Commissioners, Committees, or "authority." On the other hand, it provides that if one road is holding a 10 per cent excess of cars, it must equalize on demand within 10 days or pay a penalty of $2 per car per day in addition to the per diem rate. It may be judged that this penalty is sufficient to deter wrongdoing, as we understand that the balance has been so well preserved between the railways concerned that it has not been necessary to ask for equalization. The Texas plan also provides for arbitration of "misunderstandings which cannot be possibly settled."

These differences are pointed out not in the way of criticism of the Central and Western plan, which is presented only tentatively. Undoubtedly in its meeting in April, this plan will be amplified and the experience of the Texas roads will undoubtedly be utilized.

ARTHUR HALE,
General Agent, American Railway Association.

HOME ROUTING FOREIGN CARS

CHICAGO, ILL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The following method is suggested as a possible solution of the problem of home routing foreign cars:

A road receiving a foreign car in other than switching business, for which it has no loading, must return the car to the owner, if it is a direct connection; or, it may return the car to the delivering line, provided the delivering line has a direct con-

nection with the owner of the car, and provided the movement to be made is in a homeward direction. A car, however, cannot be back-hauled in order to return the car to the delivering line; it must be kept moving in a homeward direction at all times.

If the road receiving the car has no direct connection, and the road from which it is received has no direct connection, with the owner line, the car must be billed home via the most direct route at a rate of five cents per mile, to be paid by the billing road, this rate to apply from the junction point at which the car is delivered to its connection. It should be understood that if any road over which the car moves in a homeward direction can load the car, it will do so, and bill against the billing road only for the number of miles it is necessary to haul the car empty. The rate above named is sufficiently high to enable the roads hauling the car to pay the per diem to the owner. The car would be entitled to free empty movement over any line that had hauled it in the opposite direction loaded.

Some arrangement would have to be made that would protect the transcontinental lines from being obliged to send foreign cars home a long distance. In this case the line that took the car out to the coast should be obliged to haul it back, or pay the line that does haul it back, if it has to move empty, and because there may be a load on one line eastbound and none on the other, probably all cars in the coast territory would have to move back via the line that took them west. There should be some local agreement between the transcontinental lines whereby the empty mileage would be equalized in some mutually satisfactory way.

E. E. BETTS,
Superintendent of Transportation, Chicago & North Western.

ECONOMICAL CAR DISTRIBUTION

ROANOKE, Va.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I submit herewith a skeleton plan of economical car distribution and compensation to owners, which, in view of the importance of the subject, might draw forth comment. The following factors are governing:

(1) Keeping enough cars in service to move the business of the country.

(2) Sufficient compensation to justify carriers putting cars in service to meet the requirements.

(3) Elasticity and economy in operation; (a) to handle the maximum business; (b) to handle light business and provide track storage for idle cars.

Since the first depends upon the others separate discussion is unnecessary.

We may proceed with the second on the theory that elasticity and economy in operation are controlling, and depend on free interchange of cars between carriers and reloading at the nearest possible point to where they are made empty, with the result that the burden of furnishing empty cars is thrown upon the lines that originate the heavy volume of traffic.

Coal, flat and refrigerator cars, by reason of their not being suitable for the general run of freight, can only be handled economically by returning them promptly to the owning carrier when they are made empty. It follows that these cars should be settled for between carriers at a per diem rate sufficiently high to force their return to their owners promptly. Since these types of cars represent those which lines heavily supplied with cars are obliged to put in service in large volume, due to the necessity for originating carriers to furnish all equipment, it should be to their interest as well as that of others to adopt some plan in the interest of elasticity and economy in operation as regards the remaining types.

Therefore, as to the third principle the following is suggested: As to the interchange of box and stock cars, the lines should be grouped in a manner similar to that used by the American Railway Association in computing car surpluses and shortages. A daily report should be made by all lines to the representative heads of the individual groups, showing the surplus or shortage.

(a) To handle maximum business:—If a line is short of cars, and desires the group to furnish them, it will state at what point or points delivery is desired, and the representative of the group will have cars billed and forwarded to it at the present rate for short-hauling worn-out cars, provided other roads in the group have a surplus. If surplus cars are insufficient, the number available should be pro-rated among the roads making application. No road should be called on to furnish cars to other lines unless it actually has a surplus. Cars should be billed via the shortest route as to mileage and per diem should be paid to the owners as heretofore; the expense of short-hauling to be borne by the line calling for cars. The line should obtain free of the haulage expense any cars other lines participating in the business might be able to furnish for return loading. This is the limit of free assistance available at present since owners cannot secure the return of their cars empty when needed.

(b) To handle light business and provide track storage:—When more surplus cars turn up in a group than are needed by its member lines, or are required by other groups, they could be disposed of economically as follows:

Storage tracks should be constructed or set aside at convenient points as designated by the representative of the group, acting as chairman of a committee formed by the member lines. On account of the particular convenience and economical advantage to it, a line constructing or setting aside a group storage yard adjacent to its tracks should do so at its own expense. When a surplus exists in a group, therefore, the representative should order the delivery of cars to storage tracks; each such storage yard being in charge of an employee reporting only to the representative of the group. Cars forwarded to the storage tracks should be short-hauled at the regular rate at the expense of the forwarding line.

Cars should be reported to the owners when they are received at the storage yard, by the employee in charge or his representative, and per diem should cease until they are moved. When cars must be removed from storage to fill a member line's requisition, the representative of the group should order the delivery of the number needed by such of its immediate connections as are members of the group, in the proportion that they have received the same types of cars under load during 60 days from the short carrier—thus gradually withdrawing the stored cars without cost.

To sum up:—Attention is drawn to the principle that to handle the maximum business a carrier would pay a minimum cost for aid in times of extended shortage, and to handle a light business would be able to dispose of surplus cars more economically than under the present practice.

While there is a particular advantage in the group system because temporary surpluses and shortages rarely extend beyond the territory included, some change in the country-wide situation might result from the stoppage of cars moving to owners. If so, it would be necessary to exchange cars between groups on the same basis as suggested above for removing cars from storage, cars being returned from one group to another in proportion to the receipts under load for the previous 60 days.

It may appear doubtful whether cars could be thrown to the road or group needing them, on the principle of each line turning over cars in proportion to its receipts, but should any line be unable to deliver its proportion, the fact that more cars accumulated at another storage yard correctly located would be evidence that the lines were originating more than their proportion of the surplus, and that if delivery were forced on them, these railroads would not be carrying an undue share of the burden.

Although the theory would have to be tested, it seems a safe assumption that, with a rule requiring the withdrawal of the oldest cars from storage first, the owner of an individual car would not lose in so far as return on his investment in these types of equipment was concerned, more than he ordinarily would in times of depression.

K. V. CONRAD.

Is The Railroad Y. M. C. A. Really Worth While?

PART II—The Practical Advantages are Outlined and the Extent of the Religious Activities Is Discussed

Is the Railroad Y. M. C. A. really worth while? Yes, for a great number of reasons, and on a strictly business basis.

As one division superintendent put it, the railroads cannot afford to invest in any enterprise which will not earn at least 10 per cent on the investment. On the surface it would seem that the results are largely indirect and could not be traced, inasmuch as the greater part of the return is in the insuring of keener, brighter and more intelligent workmen. Actually, however, it is not difficult to obtain evidence of results of a most practical and concrete nature.

Unfortunately most of the railroad terminals are located in the most undesirable parts of the community, and usually the district is more or less thickly infested with saloons and other places of vice. Unless some special provision is made, the men who come in from their runs and are in need of refreshment and rest have great difficulty in securing good accommodations at any reasonable price, or any price, and are driven to the saloon, where they will at least be sure to find companionship and a certain amount of recreation. The result is that they are often far from fit when the time comes for them to take their trains out. When we consider the complications in making up and getting the trains over the road and the possibilities for preventing damage to goods, and accidents to life and limb, if keen, bright men are in charge, it is not hard to see where railroads can make big savings by doing their part to keep the men in a fit condition.

General Superintendent Rine, of the Lackawanna, after relating a number of specific instances of the benefits of the Railroad Y. M. C. A., exclaimed emphatically: *"It is a real asset to the railroad.* It has raised the standard of the men and improved their condition by giving them an opportunity to spend the day or night at their layover point, away from their home terminal, amidst proper surroundings, where good, plain food is furnished and clean sleeping quarters are provided at low cost, and where their thoughts are turned in the right direction to have them lead better lives and to fulfill their duties to the public, to the railroad, to their co-workers and to themselves and their families. *I don't see how we could get along without the Railroad Y. M. C. A."* J. B. Yohe, general manager of the Pittsburgh & Lake Erie, expressed the same thing in this way: "I firmly believe that the Railroad Y. M. C. A. stands today as one of the greatest factors for safety first on American railroads and as such deserves the support and co-operation of railway managers. Speaking of the results obtained so far from the work on the Pittsburgh & Lake Erie, the management is satisfied with its investment and believes the return to the company in vastly improved service received from employees who have co-operated most heartily in availing themselves of the privileges offered, has more than justified the expenditures of time and money which have been made."

Few railroad executives are fortunate enough to have escaped experiences which have cost their companies thousands and thousands of dollars because some engineer or conductor, after spending an afternoon or evening in a grog shop, allowed an accident to come about which never would have happened had he been in proper physical and mental condition. Emphasizing this point of view, a division superintendent outlined in detail the great care which is exercised in the maintenance of locomotives in order that they may properly perform their functions. It had been his observation that the more care taken to keep these machines in prime condition the less the total cost of maintenance over an extended period of time. "Why," said he, "do the railways place so much emphasis upon keeping the machine in 100 per cent condition and yet give so little attention to keeping the men in a similar condition? A 100 per cent machine operated by a 50 per cent man will give 50 per cent returns, not 100 per cent."

The same division superintendent directed attention to the fact that he had never had a man on the carpet for missing a run or reporting late who had spent the previous night in a Y. M. C. A. building. On the other hand, many times trains had been delayed and the schedules over the entire division have been disarranged because men who had spent the night elsewhere were not in condition to report promptly when they were called the next morning. Several officials emphasized the fact that if it became necessary to run an extra train, crews can always be quickly assembled where the men spend their leisure time in the Association building.

Another feature of very considerable importance is that when the engine and train crews stop over at the Association building, those at the head end of the train get acquainted in a most intimate personal way with those at the rear end and thus get to understand each other better, resulting in closer co-operation and team work in handling the trains on the road. Moreover, the local officers and foremen often frequent the building and meet the men on a social basis, resulting in a better understanding all around.

At many points the Railroad Y. M. C. A. secretaries arrange to cash the pay checks of the members of the association and sometimes for all of the employees of the terminal, regardless of whether they are affiliated with the Y. M. C. A. or not. Usually there are no banks in the immediate vicinity of the terminal, and if the Railroad Association does not extend this courtesy, the men must depend upon the tradesmen, which in the majority of cases means that they have to patronize the saloons, for these are always wide awake to the possibilities of attracting men by performing some service, inexpensive in itself, which will encourage the men to frequent their places.

Because the men are assured of satisfying, well cooked food at their lay-over points, and because clean, comfortable sleeping quarters and healthful recreation are available at the Y. M. C. A. building, it has been possible to attract a better class of men for trainmen and enginemen, and this has been a considerable factor in improving the efficiency of operation on many divisions. It is reflected in the fact, and this was mentioned by several railroad officers at different points and on different roads, that the men are more prompt and more careful in paying their bills, and the standard of their method of living and their home life is much higher than before the Railroad Y. M. C. A. was established.

The superintendent of a division on the Buffalo, Rochester & Pittsburgh said that it would be practically impossible to get along without the Railroad Y. M. C. A. on his division, and that if for any reason the building was suddenly burned down or wiped out of existence, steps would be taken to replace it before the ashes had cooled.

A superintendent of motive power is authority for the statement that since the new Y. M. C. A. building had been built on one division the appearance of the men as to neatness and dress was distinctly noticeable. "After all," as he expressed it, *"the strength of a railroad is in its men,* and anything which may be done to raise the standard morally, mentally or physically is bound to pay good returns."

Following is a typical instance of what is being done by the Railroad Y. M. C. A. secretaries in bringing up the standard of the men, and thus helping to promote efficiency. The road with which one secretary is connected hired a boomer fireman. He was dead broke and the Y. M. C. A. people staked him for the

first month by providing his meals and sleeping accommodations on credit. He made a splendid record in his work, but at the end of a year, having saved up $100, was attacked by the "wanderlust." The Railroad Y. M. C. A. secretary had become interested in him and had been watching him closely. He persuaded him not to give up his job and thus lose his rights, although in order to do this it was necessary to cultivate the man and keep in touch with him for a considerable length of time. Under the advice and inspiration which he received from the secretary he continued to save his money and is now married and happily located. In many cases the secretaries have been instrumental in helping to patch up domestic and other difficulties, thus relieving the minds of the men of the worry which, if it had continued, would have seriously affected their efficiency.

L. H. Turner, superintendent of motive power of the Pittsburgh & Lake Erie, is well known by his friends and intimates as being of a most practical nature. Within the past two or three years he has been led to take a very deep interest in the Railroad Y. M. C. A. work; this because of a belief on his part, based on experience, that it presents a wonderful opportunity for improving the efficiency of the staff. It also provides the opportunity for the officers and men to cultivate and better understand each other, thus automatically preventing many of the misunderstandings and difficulties which are liable to develop under other circumstances. Here is what Mr. Turner has to say on the question from a business standpoint: "Railroad companies will be forced to recognize the fact that when they put up buildings for the comfort of their men and equip them with libraries and other facilities for instruction along the lines of their work, that they are not contributing to a charity but simply taking a common sense view of a business proposition, as it seems to me that a railroad that has the greatest number of sober and intelligent men is bound to set a high mark in economical and efficient operation."

THE RELIGIOUS PROBLEM

The railroads in all cases contribute to the cost of conducting the work and employees are invited to take advantage and make use of the buildings. The question will undoubtedly occur as to whether the nature of the religious work which is carried on will offend or antagonize any of the employees, who naturally have different religious beliefs, and many in fact may be non-Christian. The Y. M. C. A. is generally known to stand for aggressive Christian work. In light of this, what should be the attitude of the secretary and how does he handle this most difficult problem?

The following quotation is taken from that part of the Railroad Association Handbook which refers to the relations of the railroad secretary to the church and particularly to church factions: "A secretary should be broad in his church relationship, always glad to assist any effort whose purpose is to help men and extend the kingdom of God. He should be to railroad men a concrete example that deep conviction is not inconsistent with broad sympathy and generous co-operation. He should remember that the church is not confined within the walls of any building or the limitations of any system of doctrine." In other words, he must stand on the broad simple teachings of the Master and his work will be effective only to the degree to which his character and example conform to these teachings. Can this meet with serious objection on the part of any Christian sect or faith? Surely not!

In talking with railroad officers on the different roads which were visited, and regardless of whether they were on the local board of managers of the Association or not, and regardless also of denominational affiliations, it was suggested time and time again that a most noticeable development and upbuilding of character invariably followed the installation of the Y. M. C. A., and that this development of bigger and broader men was a real asset to any railroad, the value of which was beyond computation.

In every case where the Railroad Association secretary eased up on or neglected active Christian work, such as the conducting of Bible study classes and religious meetings, either because of lack of interest or fear of offending others, the tone of the whole institution was noticeably lower than it should be. This in some cases is said to be so evident that railroad officers, not always particularly interested in religious work, have found serious cause for complaint as to the effectiveness of the institution as a whole. Doubtless, although time did not permit sounding out the men on this phase of the subject, the men themselves were much less impressed with the character of the establishment than would otherwise have been the case.

A young secretary had been placed in charge of the work at an important point. He felt that he ought to start a Bible class and decided that the best time of day to hold it would be about ten o'clock in the morning. He made up his mind to call the men together and start the work at a certain date. Somehow or other when the time actually came he did not quite have the never to take this step. From day to day he put it off, until after a severe struggle he made up his mind that he would surely get started on the following day. When the time came he found a group of the toughest men on the division in the building. Two of them were playing pool and their conduct and language was anything but polished. The young secretary screwed up all his courage, feeling almost certain of meeting defeat, and walked over and invited these men to come into the Bible class meeting. They thanked him, put up their cues and went with him into the study room. Needless to say their example was followed by many of the other men in the building. The meeting proved to be a big success and was followed by similar meetings at frequent and stated periods. It is not hard to believe that the whole spirit of that particular association was changed for the better.

It only emphasizes the truth that humanity in general has a natural tendency toward higher and better ideals. What is needed most of all is fearless and capable leaders. It is this feature that sets off the Railroad Y. M. C. A. in distinct contrast to the club house or social clubs and is responsible for its greater success and effectiveness. The club room can supply social and educational features and can meet the physical needs of the men by providing restaurants and dormitories; but something vital is missing. It is the spirit of broad Christian sympathy which is inspired and directed by the trained Railroad Y. M. C. A. secretary.

Of course there is no compulsion as to attendance at the Bible study or religious services. Men who, because of the nature of their work, seldom have opportunity to take advantage of other religious privileges are invited to attend but the invitation is not insistent. Naturally also each of the services must be simple and complete in itself, for most of the trainmen and enginemen cannot be present with any marked regularity.

If any criticism were to be made of the religious work it would be that some of the secretaries do not follow it up progressively enough. The comparatively small number of Bibles which are in evidence in some of the buildings is also something of a surprise. In these days when the activities of the Gideonites have placed Bibles in each room of most of the hotels throughout the land, we would rather expect to find a more plentiful supply in the Railroad Y. M. C. A. buildings.

CONCLUSION

In conclusion there can be no question but that the Railroad Y. M. C. A. gives a handsome return on a strictly business basis, provided, first, that the proper type of secretary is available; and, second, that the work receives hearty support and co-operation from the railroad officers. J. B. Yohe, general manager of the Pittsburgh & Lake Erie, has expressed this latter truth in the following words: "This development

could not have been available without hearty co-operation on the part of railway managers induced by sympathy with the aims of the association and a belief in the practical value of the object it seeks to achieve, as well as confidence in the attainment of that object for the benefit of both company and men."

THE GENERAL MANAGER'S SUPERVISION OVER DIVISION PERFORMANCE

The cost of the three items, road enginemen's wages, road trainmen's wages and fuel for road locomotives, forms almost half of the total transportation expenses of many large roads and over a third of the total transportation expenses of the great majority of railroads in this country. Furthermore, a considerable proportion of other transportation expenses depends directly on the volume of these three expense accounts. Thus, lubricants, water, engine house expenses and train supplies and expenses vary more or less directly as do these three accounts. Yard expenses may or may not vary inversely with road expenses; but it needs no argument to demonstrate that one of the most important duties of the division superintendent is to reduce to a minimum the three items which bulk so large in transportation costs. It follows that one of the most important duties of the general manager is to keep strict supervision over these three items of expense.

Adequate supervision can only be obtained through a prompt, accurate and comprehensive knowledge of the results being obtained on each division from day to day, as well as from month to month. One of the most effective methods of constructive supervision of the work of division superintendents is to place before them a record of their own and other superintendents' past performance; but one great difficulty with American operating statistics has been that they are a record of past performances so far in the past that they have only the academic interest of ancient history. Besides promptness in collecting and distributing operating statistics, simplicity of form as well as simplicity of compilation is essential.

For the purposes of this study the expenses of road enginemen, trainmen and fuel in freight service only will be considered. That being so, ton-mile cost is, of course, the common denominator to which fuel and wages should be reduced.

The Western Maryland under its new management has shown one of the most remarkable improvements in performance of which there is any record in recent railroad history in this country, partly, of course, because the performance in previous years was very far from satisfactory. This was not due entirely to conditions which any management, no matter how able, could have altered. Conditions quite beyond the control of the management had to be lived through and the new management is reaping the benefit of a comparison with a period of sickness. Nevertheless, discounted as much as is necessary to be entirely on the safe side, a reduction in the ratio of transportation expenses to total operating revenues in the first six months of the present fiscal year as compared with the corresponding six months of the previous year from 45.07 to 36.04 is a remarkable achievement. With transportation revenues only about 3 per cent less in the six months ended December 31, 1914, than in the corresponding six months of 1913, transportation expenses amounted to $1,551,000 in 1914 as compared with $1,943,000 in 1913, a reduction of $392,000. The Western Maryland management believes, and probably rightly, that only a beginning has been made in the solution of the problems on that road, and the present study deals only with the steps that have been taken to secure adequate supervision over the expenses of each division for enginemen and trainmen's wages and fuel for road locomotives.

The Western Maryland is divided into two divisions, the Eastern and the Western, and each division is divided further into three districts. One of the primary objects to be attained by the introduction of a new method of supervision, was to place before the general manager, general superintendent and division superintendents as promptly as possible the cost per 1,000 ton-miles of the three items of expense. A second and equally important object was to have sufficiently detailed figures accompany this report of cost per 1,000 ton-miles to permit of exhaustive analysis. The Western Maryland has devised a system which goes further than this and compels the superintendent to make his own analysis. A daily report of cost of trainmen's wages and of fuel is made up in the general superintendent's office within 36 hours of the events recorded and is sent out on that day, or the next, to the general manager and to the division superintendents. On this report each freight train is shown separately, with the train number, engine number and name of crew. Each locomotive is given a rating over each district in which it is in service. The daily report shows this rating together with the actual number of tons moved, the per cent which this actual tonnage is to total capacity, the number of cars in the train, the actual ton mileage, the reason for the difference between the potential ton mileage and the actual ton mileage, divided under the heads "mechanical defects," "fast freight," "set outs and local work," "nothing to move and car limit," and "weather conditions." In addition there is shown the number of tons of coal consumed over the dis-

FORM C T 180.

THE WESTERN MARYLAND

19___

Per Cent. of Total Engine Efficiency Unused ——

Sheet No. 1	Rating Haul This Date		TONNAGE TRAINS: Total Ton Miles to Date — This Month	Last Month	Total Cost to Date — This Month	Last Month	Cost Per 1000 Ton Miles to Date — This Month	Last Month	This Date	Last Year	No. of Train Miles — This Date	Last Year	No. of Engine Miles — This Date	Last Year	Cost Per Train Mile — This Date	Last Year
	1st Acctg. Dist.	%														
	2nd " "	%														
	3rd " "	%														
	Eastern Division	%														
	4th Acctg. Dist.	%														
	5th " "	%														
	6th " "	%														
	Western Division	%														
	System	%														

Helper Eng. From To	TRAIN, ETC. — Direction	Conductor	Engineer	Train	Engine	OUT OF TERMINAL — Leaving	Capacity in Tons	Tons Moved	% of Capacity Moved	No. of Cars	Actual Ton Miles Moved	TON MILES OF ENGINE EFFICIENCY LOST (AND CAUSE) — Mech'l Defects	Fast Freight	Set Outs and Local Work	Nothing to Move and Car Limit	Weather Conditions	Ton Miles Should Have Moved

Form of Daily Report

trict, total cost of fuel, wages of crews without overtime, cost of overtime, total cost of labor and fuel, miles run, hours on duty of crews, average miles per hour, and cars handled showing revenue loads, deadhead loads, and empties. Overtime made is analyzed as between Orders and Trains, Accidents, Engine Failures, Maintenance of Way and Signal Work, Waiting for Helper, Station Switching, and Terminal Delay. Cost of helpers is shown separately. Then the total cost per 1,000 ton-miles is arrived at. *All of this information can be obtained or derived from train despatchers' sheets and conductors' reports.*

The actual time consumed in making such a report as this for each train for each district is small, but for all the trains over all the districts of a busy railroad for a month it makes a very considerable aggregate. On the other hand, the more trains that are run and the busier a road is the more necessary it is that the superintendent have an adequate means of supervision and the general manager an adequate check upon the work of the superintendents; also, the amount of money which may be saved through more economical operation of each train varies directly with the number of trains and the volume of business.

One of the thorns in the flesh of the division superintendent is the necessity for making an explanation of a bad monthly showing weeks after the close of the month, and one of the factors which rob such explanations of much of the value which they might have to superintendents is that they are made to repel an attack, to win a particular case, and are therefore in the nature of special pleading.

One of the most admirable features of the Western Maryland form of daily reports here described is that these reports do away in large measure with the necessity for demanding explanations from superintendents. The report is itself an explanation, as it is also an analysis; and another important feature is that the report, insofar as such a thing is possible, compels a superintendent to himself make an analysis of the performance on his division and at the same time gives him a scientific method to be applied in making this analysis. There is nothing personal about the method; it is detailed enough and comprehensive enough so that the superintendent cannot claim the "showing" does not correctly represent the facts, or is against him because of reasons beyond his control. The report is self explanatory. Furthermore, there is nothing in it which the superintendent can mistrust. There was a letter printed in the *Railway Age Gazette* recently commenting in a joking way on "statistics," which, however, probably struck a responsive chord in the great majority of operating men. In the Western Maryland form of daily report there are neither adulterated figures nor arbitrarily assigned figures.

THE MERCURY FREIGHT HOUSE TRACTOR TRUCK

The continually increasing cost of handling l. c. l. freight has led within the past two or three years to the substitution of motor trucks for hand trucks in a number of freight houses where the trucking distances were relatively great. A further development has recently been made by the use of these motor trucks as tractors pulling carrier trucks as a locomotive hauls a train of cars.

The Mercury Industrial Tractor

The Mercury Manufacturing Company, Chicago, has designed and built a tractor truck for service of this character in freight and ware houses. The frame is of heavy channel iron with riveted and welded connections. It is supported on three wheels, the single front wheel being directly connected to the steering lever and giving it a very short turning radius, so that it is able to turn inside a car. The rear wheels are 21 in. in diameter and the front one is 15 in.; all three being equipped with 3½ in. solid rubber tires. The electrical controller providing four speeds ahead and two reverse, is at the right of the driver's seat. The control handle is automatically locked and cannot be moved unless the driver is in his seat, while a large brake drum is provided on each axle operated

RAILWAY COMPANY. TRANSPORTATION DEPARTMENT—DAILY TRAIN TONNAGE REPORT.

UNIT VALUES — WAY FREIGHT TRAINS

Avg. No. Tons Per Train Mile		Avg. No. Tons Per Engine Mile		Avg. Miles Per Hour		Avg. Cars Per Train		Overtime $ of Total Wages		Helper Service $ of Cost		$ of Crews Paid Local Rate		No. Trains Run		No. Cars Handled		Cost Per Train		Avg. Miles Per Hour		Avg. Cars Per Train		Overtime $ of Total Wages	
This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year	This Date	Last Year

No. Tons Coal Consumed	Total Cost of Fuel	Wages of Crews No Overtime	Cost of Overtime	Total Cost Labor and Fuel	Miles Run	Hours on Duty	Avg. Miles Per Hour	CARS HANDLED			OVERTIME MADE (AND CAUSE)									Cost of Helpers	Cost Per 1000 T. M.	REMARKS
								Rev. Loads	D. H. Loads	Empties	Orders and Trains	Accidents	Eng. Failures	Car Failures	M. W. & S. Work	Waiting for Helper	Sta. Sw'g	Term. Delay	Total			

Form of Daily Report

by a foot pedal. The motor and the axles are ball bearing throughout, while all parts are readily accessible for inspection and repair. Power is supplied by a storage battery with 250 ampere hours capacity, sufficient to operate the car continuously for a full working day. The tractor has a wheel base of 38 in., a length over all of 67 in., a width over all of 38 in., and weighs approximately 1,900 lb.

One of these tractors has been used continuously at the freight

Pulling a String of Trucks Loaded with Miscellaneous Freight

house of the Chicago Junction Railroad, Chicago, since August 1, 1914, and the accompanying photographs show it in service at that point. This tractor is used in the same manner as a switching locomotive, picking up the ordinary Reynolds trucks at the point of loading in the order in which they are to be cut off and leaving them at the doors of the cars in which they are to be unloaded. Each Reynolds truck is loaded only with material for one car. The tractor is operated by one man with one assistant to couple the various trucks together and drop them off. It is not necessary to stop the train to cut off the carrier trucks. This tractor has been operated by a foreigner, a regular employee of this house, since it was received.

By the proper arrangement of the connecting chains the trucks are made to track perfectly, and one of the photographs shows a string of these trucks being pulled around a sharp 90 deg. angle without any special assistance. In this way it is possible to pull a string of trucks through a crowded house without hitting other trucks or freight standing alongside. As many as 15 trucks have been pulled in one train, although in regular work from 8 to 10 trucks are hauled at a time.

An average of from 140 to 160 cars of l. c. l. freight is handled at this station daily, the largest portion of which is transferred from one car to another with an average trucking distance of 200 ft. As the one tractor cannot handle all of this freight, the shorter haul is still being made by hand trucking, although it is expected that this will be eliminated on the receipt of a second tractor truck now ordered. With the one truck in service the trucking force and the cost of trucking have been reduced 25 per cent. The Chicago & Eastern Illinois has also used one of these trucks at its freight house at Twelfth street, Chicago, with similar results.

"WHO PAYS FOR MY RAILROAD TICKET?"

[From the Chicago Herald]

Governor Dunne, in his reply to the request of the Illinois railroads for a reconsideration of the two-cent fare law, remarked on the absence of "vigorous protest" from the railroads against the two-cent rate "for nearly eight years." This suggests the statement of a fact generally overlooked, though long well known to students of railroad statistics.

This is the fact that the passenger service of the railroads, taken as a whole, has long been done for less than its cost. Why haven't railroad managers said something about it before? Well, occasionally they have. They have not, as a rule, made much of a point of it.

Probably they have failed to do so on the theory on which a State street retailer delivers a five-cent purchase away out at One Hundred and Sixteenth street. There is a loss on that, but it may be made up by gains on other sales. Usually it is.

The fact is that people have been largely traveling on the railroads partly at the cost of shippers of merchandise. The shipper pays for the traveler. If shippers and travelers were the same persons this would be "as broad as it is long." But they are not the same persons, except to a limited extent.

Noting this fact, the Interstate Commerce Commission has told the railroads that they shouldn't take from their freight income to pay for their passenger service—that each service should pay its own bills.

So the question for each man to ask himself when considering the railroads' request for higher passenger fares is:

"Who pays for my railroad ticket? Am I fairly paying for it myself, or sponging on my neighbor?"

Tractor Pulling Five Reynolds Trucks Around a Sharp Corner

Arbitration of Engineers' and Firemen's Demands

A. W. Trenholm, Chairman of Committee of Managers, Explains Effect of Men's Demands on Operating Conditions

At the hearing in Chicago last week before the board of arbitration on the wage demands of the engineers and firemen on the Western railroads, it was agreed by stipulation of both sides that as it was impossible for the board to complete the hearing of testimony in time to reach a decision within the 90 days provided for in the law, which would expire on February 27, the time limit would be extended until April 20.

A. W. Trenholm, general manager of the Chicago, St. Paul, Minneapolis & Omaha, and chairman of the Conference Committee of Managers representing the 98 western railroads affected, took up in detail on February 16 the 16 articles comprising the demands of the engineers and firemen, showing the effect of each article on operating conditions. Mr. Trenholm occupied the witness stand throughout the week.

"It is the first time in the history of railroading," said Mr. Trenholm, "that any such arbitrary, unreasonable set of rules has ever been submitted to any railroad. There is no reason for splitting up a road trip from the time the engine leaves the roundhouse till it reaches the other end of its run, except the one the men set up, namely, the creation of additional compensation and getting away from giving the railroad a reasonable day's service.

"The allowance of time and one-half for overtime would not reduce overtime, but, on the contrary, would be an incentive to increase it. The movement of trains is dependent largely upon the prompt carrying out of orders and the desire of the men under present conditions to get over the road and receive their compensation on the speed basis. This would be destroyed and the incentive would be, if the train were near the average of 10 miles per hour, for the crew to take little interest in making meeting points, feeling that if they ran into overtime they would be receiving 50 per cent greater compensation."

HELPER AND PUSHER SERVICE, ETC.

With reference to the proposal that engineers and firemen in pusher, helper, mine run, work, wreck, belt line and transfer service, and all other unclassified service, shall be paid through freight rates, Mr. Trenholm said that a large proportion of such service is unassigned and is performed as a part of switching or other regularly assigned service, to which the higher rates of pay ought not to be applicable. For example, out of St. Paul practically every train has to be helped over a short grade of approximately two per cent, and a regular helper is not assigned to the service because one helper would not be of any particular use. Every engine that works in the yard some time during the day will help a train, and under the proposed automatic release rule, if an engine works for 15 minutes in helper service of this kind the men would be entitled to claim a full day's pay.

As to belt line and transfer service, the conditions vary so in different localities it would be difficult to apply a hard and fast rule. In most cases, while a man probably would be on the road for long hours the work required was not such as to justify road rates, except on particular runs. As to helper service, if it were necessary to put a second engine on a passenger train on account of a snowstorm, the proposed rule would require payment of the through freight rate for one crew and the passenger rate for the other, which Mr. Trenholm thought would be improper.

The rule requiring an increase of 10 per cent on divisions on which there is a grade of 1.8 per cent, according to the witness, would require the roads to pay mountain rates on a large number of divisions because of a very short grade, perhaps of only a few thousand feet, on some part of a division. A strict interpretation of the rule would apply on trains going from the depot level up to an elevation. At present peculiarities as to grade or mountain operations are covered by various schedule provisions to meet the peculiar situations in the territory involved. Some roads allow a day for less mileage than 100 miles, others give an increased rate, such as 10 per cent additional.

STANDARDIZATION WITH A SAVING CLAUSE

Chairman Pritchard asked whether the witness thought language could be employed by the board which would obviate the difficulties as to local conditions. Mr. Trenholm replied that if it was desired to standardize the rates and rules it could be done by a committee of operating officers and a committee of the men, who should systematically analyze the schedules and work out rules that would allow a general application, but it would be necessary to eliminate some rules that are now in some schedules and possibly put in some that are not in other schedules, because some roads do not have certain rules, but have other rules which offset them. If it were not for the saving clause he thought the board could ignore all the schedules in existence and make a uniform set of rules to apply throughout the whole territory on broad lines.

"I believe," he said, "that compared with any other labor, the engineers and firemen of the western territory are adequately paid today. Some of the special rules in the different schedules I feel are unfair. It has always been my thought that if we could co-operate with the men and agree to eliminate these rules that disturb and hurt the discipline, and are irritating, the roads could well afford to reimburse them for anything they take away, so that when we get through we would have an ideal wage schedule without loss to the men. We have never asked to reduce their pay. To make a standardization with a saving clause seems to me to be impossible unless you take the very best schedule in the territory that has everything in the way of a perquisite, and apply that schedule to every other road and bring it up to the highest level of arbitrary allowances."

PREPARATORY TIME

If preparatory time were paid for by one road in one way, Mr. Trenholm said, and a rule were adopted providing for payment in another way, it might result that on some roads the preparatory time would have to be paid for twice. On his road (the Omaha) a rule had been adopted providing for an arbitrary payment of 30 minutes preparatory time in all cases where the men worked 10 hours, but if they were paid mileage and made a day's pay in less than 10 hours they were not allowed the 30 minutes.

F. A. Burgess, one of the brotherhood representatives on the board, tried to show that as there were 386,662 trains run in the month of October, 1913, which were paid for on the mileage basis, the engineers had contributed 193,331 hours, which at 63 cents an hour, the average rate for engineers, would amount to over $121,000 without payment. "I claim we have paid for it in the mileage," replied Mr. Trenholm; "if a man takes 30 minutes to get his engine ready and leaves at 7 o'clock, and completes his run at 12 o'clock, in five hours, he has made 100 miles. He is paid for 10 hours' work, and I don't concede that because he works 5½ hours by having been on duty 30 minutes before he started he has contributed any time that he has not been paid for. I contend that it is unfair, unjust and unreasonable to pay a man both miles and hours for the same piece of work."

Mr. Burgess said that the men also contributed 29 minutes

on each trip before overtime would accrue, which he added to the 30 minutes preparatory time, and he proposed that an expert accountant be selected to ascertain the value of this time on the basis suggested.

"I would like to arrange," said Mr. Trenholm, "at the same time to compute the amount that the railroads paid to men when they did not work at all, and where they were paid 20 hours for 4 hours' service, and 10 hours for 3 hours' service, and all the elements that go into the wage of an engineer or fireman. I believe, and the committee I represent believes, that the time you speak of as having been contributed should be paid for. I am perfectly willing to concede that the railroads should pay a man for every minute he works where he is paid on the hourly basis, but there are as many cases where a man is paid an hour for 31 minutes' work as there are where he is not paid anything for 29 minutes."

As to narrow-gage service, Mr. Trenholm showed that although a simple five per cent increase above the ordinary rate is asked, the compounding of other increases, such as the differential for grades, would bring the total percentage on some roads up to about 27 per cent. On one run on the Denver & Rio Grande the engineers' increase would be 174 per cent and the firemen's increase 189 per cent. The engines used in narrow-gage service are very small and there is no reason for any increase in the rates. The demand that through or irregular freight trains, when they have to set out or pick up cars en route, shall be paid for at overtime rates in addition to the time or mileage made on the trip, Mr. Trenholm said, would result sometimes in paying the crews four times for the same work.

"If a crew makes a run in 7 hours, it is paid the minimum of 10 hours," he said. "Suppose it used one hour on the road setting out cars. For the 8 hours, it is getting 10 hours' pay, yet it would get also time and one-half for the hour setting out cars, in addition to the straight time for that hour. If the added hour brings the crew into overtime, an additional hour at time and one-half would be necessary, making four times the regular rate for one hour's work."

The rule providing for continuous time in yard service, with an allowance of 30 minutes for meals during the time paid for by the company, Mr. Trenholm said, would in many cases result in shortening the period of actual time on duty so that overtime would have to be paid, and the company would in reality be paying time and one-half for the meal hour.

INITIAL TERMINAL DELAY

The rule as to initial terminal delay, he said, is different from anything he ever knew of in any schedule, as it provides additional payment for something that heretofore has been part of the day's work.

"Regardless of the fact that the engine may be ready for the engineer and fireman to step on and move the engine," he said, "there would be no escape from paying 30 minutes' preparatory time, even if the whole day be 6 or 7 hours' work with 15 hours earned. Where there is now a switching allowance the men may hold to this under the saving clause and secure even double time. The 30 minutes would have to accrue to the men at the beginning of each trip regardless of any service, and where engines are double-crewed one man could step off and another step on, one claim final terminal delay and the other preparatory time, resulting in payment to two crews for the same time."

Whether the board of arbitration has power to prevent such pyramiding by careful construction of the wording of the award aroused a lively discussion. Mr. Nagel asked whether, if an award should be made on a subject which is not covered by the rules of one road, but which is covered by a rule on another road more advantageous to the men, the men on one road might accept the award and the men on the other road reject it, or whether the brotherhood must act as a unit with respect to the award. Mr. Stone insisted that the men on the individual roads could accept or reject any article of the award if they preferred to retain the rules already in effect.

AUTOMATIC RELEASE

The rule providing for automatic release at the end of a run, Mr. Trenholm said, would severely penalize the roads on short runs, and make it possible for men to earn two or three or four days' pay in one, unless the wording of the rule were changed. He admitted that some such rule should be provided to protect the men against abuses, and that a man, having completed his day's run, even if it required only six or seven hours, should be compensated properly if he were required to perform additional service, but he thought such conditions were generally provided for at present in the various schedules in one way or another. The schedule of the Omaha road provides that a man may be called for an additional run only up to the limit of 100 miles or 10 hours.

"The application of this rule, in its technical interpretation," said Mr. Trenholm, "is so far-reaching in its effect, that this committee hesitates to attempt full description of what the result would be, applied to so vast a territory. It is such a radical departure from the present rules and practices and impresses us as being so unreasonable and unfair to the railroads that we are at a loss to understand the purpose of it."

An actual run described by Mr. Trenholm is covered by six trains daily except Sunday on the Rock Island between Elmira, Ia., and Riverside. The engine crew on each of these trains covers 115.2 miles per day, working 9 hours and 57 minutes, for which it receives 15 hours' pay, $6.22 per day for the engineer and $3.97 for the fireman, the engines being very small. On these runs, there would be, under the men's demands, a pyramiding of rates and rules covering preparatory time, initial terminal delay and final terminal delay at three points daily, plus 100 miles under the automatic release rule for each of six runs daily by each crew, while on top of all would be added 10 per cent because part of the track is 1.8 per cent grade. As a net result, each engineer would receive $33.66 per day, or $1,009.80 for a 30-day month, while each fireman would get $21.69 a day, or $650.70 for the month, an increase of 441 per cent for the engineer and 447 per cent for the fireman.

In discussing the demands that crews "tied up" under the federal 16-hour law between terminals be paid continuous time without deduction for time so tied up, Mr. Trenholm said: "This would abrogate the agreement signed in 1908 with the four brotherhoods, in which specific provision was made for this situation. Conductors and trainmen still would be bound by this agreement. The rule makes no exceptions, and the company could not release a crew between terminals without paying full time, even when necessary because of washouts, snow blockades or other conditions over which we have no control. Such tie-up or release might be at a point where there are liberal accommodations for sleeping and ample rest. Under the overtime rule the men would even claim time and one-half for time thus spent in rest. Under the "deadhead' rule, an engineer or fireman riding in a coach would get not only the rate, but all the added arbitrary payments going to the crew working on the engine, such as preparatory time, initial and final delay, running for coal and water, icing cars, loading or unloading cars.

"Another rule demands continuous time after 15 hours when held away from home terminals, including the rest period. Having once exceeded this time, the pay would become continuous whether for 24 hours or a week, regardless of snow blockades, washouts or other emergencies. If a man made 100 miles in four hours at the $5 rate and was then held for 24 hours in excess of the limit set, he would draw $30 for the 24 hours. This committee cannot conceive any justification for this when no service is rendered."

SURPRISE TESTS

As to the demand for the elimination of surprise tests under certain conditions, Mr. Trenholm said: "The committee is

of the opinion that properly conducted efficiency tests are necessary to safe operation. The tests should always have due regard to the safety of employees, and while it may be true that in so large a territory there might be a few individual cases where the zeal of some local officials may have gone somewhat beyond this, we are very strongly of the opinion that matters of this nature are not a proper subject for a wage schedule, and that the maintenance of discipline, proper obedience to rules and regulations and the manner of their enforcement should be left to the operating officials of the railroads."

In describing the efficiency tests on his road he said: "After some time it developed that unfair reports were being made, and after long thought I conceived the idea of inviting the labor organizations to elect a committee of five men, one from each, while I selected five officials. These men meet once a month in my office. They have all the authority I have to examine records and it is their vote which decides a complaint of the men. In case of a tie I cast the deciding vote, but we have met every month for several years since the board was formed and I have never been called on to vote. Every decision has been unanimous. When 100 tests have been taken of any engineer with no failures, the man is given a '100 per cent efficiency' certificate, which shows that he has been tried and found 'there.'"

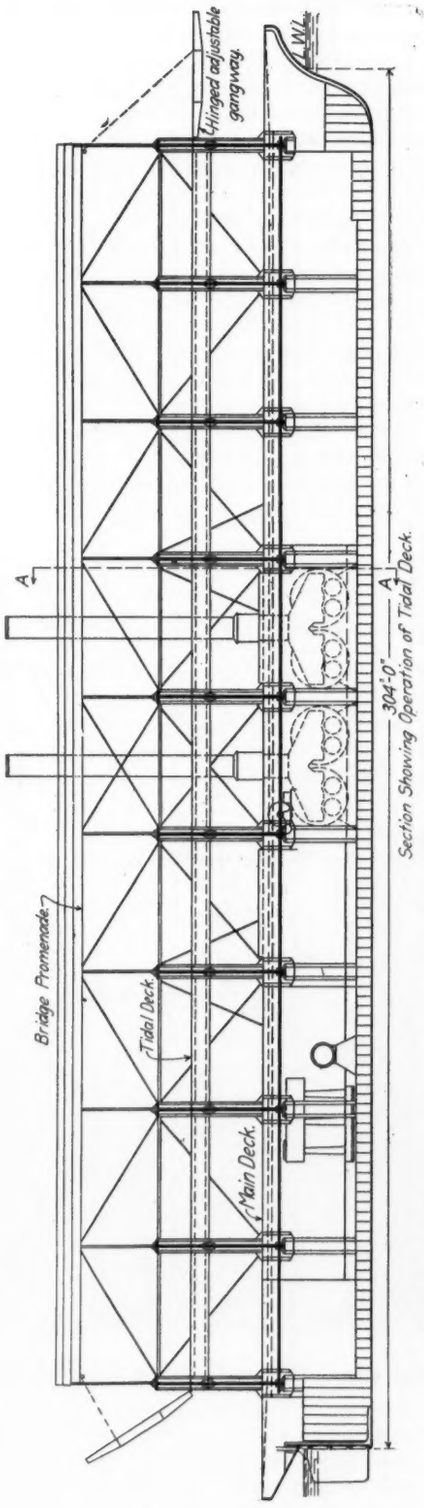
A NEW CAR FERRY WITH ADJUSTABLE DECK

It is planned to extend in the near future, the operated section of the new National Transcontinental Railway in eastern Canada, which is now in service from its eastern terminus, Moncton, N. B., to a point across the St. Lawrence river from Quebec. As the Quebec bridge will not be ready in time to start operation as soon as desired, a car ferry of unusual design has been built to handle both freight and passenger trains between Quebec and Levis. It is designed to carry a maximum train load of 1,440 tons in an estimated time of 45 min. for loading, moving the 2½ miles across the river and unloading.

A Portion of the Main Deck Showing the Track Supports on the Movable Deck Overhead

The two principal difficulties in providing a ferry for this service were the large amount of ice encountered in this latitude during the winter months and the tidal variation in the water level which amounts to about 18 ft. The ways in which these difficulties were met in the design of the boat constitute its chief features of interest.

The hull of the new ferry is 304 ft. long and 65 ft. wide at the 15-ft. load line. It has a molded beam depth of 23 ft. to the main deck and a mean draft not exceeding 15 ft. under the full train load. The trains will be carried on a movable car deck supported above the main deck by 10 columns on each side,



Longitudinal and Cross Sections of New National Transcontinental Railway's Car Ferry

the position of this deck being adjusted by large gun metal nuts at the ends of the transverse girders supporting the deck which engage vertical screws hung on ball bearings from the top of supporting columns. The side columns are connected at their tops by transverse latticed girders; longitudinal bracing is provided between all columns, and exterior struts are carried out to the edge of the main deck, making the superstructure rigid in all directions. The load on these columns is distributed to the keel by special struts below the main deck. Three tracks 272 ft. long are provided on the movable deck, these being carried on latticed girder stringers under each rail. No adjustment in the elevation of the tracks on the landing piers will be necessary, the slight inequality due to the motion of the vessel under changing load being taken up by adjustable hinged gangways at each end of the car deck. These gangways are attached to the end of the movable deck by ball and socket joints and their outer ends are adjusted to the desired level by two lines of three-part cable attached to the top of a braced steel frame on the deck. The steel superstructure above the highest position of the car

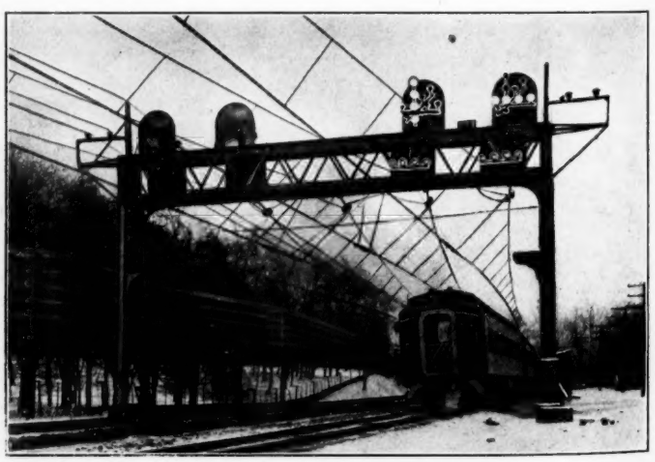
Looking Down One of the Tracks on the Movable Car Deck

deck supports a promenade around the vessel with a bridge platform forward from which all of the operations of steering and maneuvering are directed. The space below the main deck is occupied by the boilers, coal storage, engine rooms, accommodations for the crew, etc.

The vessel will be propelled by two sets of twin-screw triple-expansion surface-condensing engines with cylinders 23 in., 35 in. and 55 in. in diameter, having a 33-in. stroke. They are designed to run at 120 revolutions per minute with a steam pressure of 165 lb. A special feature of these engines is the shafting, which is made much stronger than usual to withstand the shock received when the propellers strike ice during the winter. The propellers themselves are of nickel steel and of an especially strong design. An ice-breaking propeller is provided in the forward end of the vessel, driven by a set of compound surface-condensing engines, the cylinders being 15 in. and 32 in. in diameter with a 21-in. stroke. This propeller, which is also of nickel steel, runs idly during the summer months. The vessel is strengthened throughout for heavy ice-breaking service. The car deck is raised and lowered by worm wheels driven from horizontal shafting which runs the length of the vessel on each side, the gearing being arranged to lift the deck fully loaded at a rate of one foot per minute through a distance of 18 ft. The engine operating this deck is of the four-cylinder high-pressure type, of massive design, driving a transverse shaft through double helical spur gears. This shaft drives the main line shafting through miter wheels at each end. The worms which drive the vertical screws carrying the car deck are of forged steel and the wheels of cast iron. The screws are driven through a loose forged steel sleeve and sliding key arrangement fitted into the box of the wheel. Steam will be supplied by two batteries of four single-ended return tube boilers, 12 ft. 4¼ in. in diameter and 9 ft. 6 in. long, having a total heating surface of about 10,400 sq. ft. and a grate area of about 350 sq. ft. An electric winch with two drums operated by a 41. hp. motor is located on the car deck for hauling cars on and off the boat. Two 25 hp. motors are provided for raising and lowering the gangways and two generators of 40 kw. and 20 kw., respectively, are installed for supplying the electric current for the operation of motors and for lighting. Two steam windlasses with slip drums are provided for mooring.

BEAM LIGHT SIGNALS ON THE PENNSYLVANIA

The new arrangement of electric lights (uncolored) to take the place of semaphores, as signals, on the Pennsylvania Railroad, between Philadelphia and Paoli, to be used both day and night, was described in the *Railway Age Gazette* of January 8, page 61. These signals have now been put in service over a distance of five miles, Overbrook to Bryn Mawr, and a photographic reproduction of one of the signal bridges, sent to us by the courtesy of the Philadelphia Public Ledger is given in the accompanying engraving. This is a four-track line and the observer sees the two signals for the two right-hand (west-bound) tracks. For the outer track the stop indication, protecting the train seen in



"Beam-Light" Signals at Rosement, Pa.

the picture, consists of the four lights which are arranged in a horizontal line in the upper part of the hood or background. The next track is clear for three blocks in advance and the clear indication in the signal (at the left) consists of the four lights arranged in a vertical line.

On this electrified section the block sections are about 3,500 ft. long and "three-block information" is given. If the line is clear for only two blocks ahead, the clear signal is given by the lights in the lower part of the signal (corresponding to a second semaphore arm) indicating "proceed, prepare to pass next signal at medium speed."

The wires to be used for electric traction, seen in the engraving, are not yet in regular use. It is expected that electric motor cars will be put in service within a month or two.

Meeting the Problems of the Express Companies

Express Service Must Respond to the Public's Demands; Must Earn Revenues Commensurate With Its Service

By B. D. Caldwell
President, Wells Fargo & Company

The slogan "Made in America," or "Made in the United States of America," now current throughout our land, will undoubtedly spur our people to new initiative and creative endeavor. It should have another and, to my mind, more immediate effect, namely, a revival of appreciation of the usefulness of institutions whose prosperity has been affected through lack of that public encouragement and protection which are essential to their well being.

Extremes of criticism and regulation, moderation in which would have been salutary, have driven many of these institutions to the trenches of defense and slowed the wheels of progress. As measures of reform, some of this regulation has been in response to a wholesome public sentiment of disapproval of hurtful tendencies caused by unwise use of great power or wealth. When rationally applied it has served its legitimate purpose in checking selfishness and discrimination, but too often it has been so extreme as to be repressive of legitimate and laudable endeavor. Just criticism and wise processes of reformation are wholesome and invigorating. When inconsiderate or extreme they always produce the contrary effect. Other efforts at reform have been based upon a lack of understanding of the problems involved or upon a blind following by those who, without knowledge themselves, do not investigate the underlying basis of criticism before joining in its expression. There have also been the harmful effects of fickleness of appreciation which condemns today what it exalted yesterday. Institutions which have been used as ladders to success have been assailed when the beneficiaries have thought they were strong enough to climb alone, finding too late that in bringing injury to their benefactors they have hurt themselves.

We all realize that transportation is as essential to our commerce as the sun is to the day. The slogan "Made in America" would be meaningless without transportation to carry our products of mine, soil and manufacture to all the worlld. We seem to forget not only that our railroads were "Made in America," but that they are its greatest creation. They are admittedly the greatest railroads in all the world! As the children of our creation, they may require regulation and sometimes correction, yet our paramount obligation is their protection, encouragement and best development rather than mere discipline. Let us make them greater, more efficient and more useful by making them more prosperous.

While my talk of tonight has to do mostly with the express, I could not forbear this expression of appreciation of the greatness of the service of our railroads and of the urgent need for an extension to them, by the American public, of definite and substantial support in their efforts to maintain their credit and usefulness. Nor should we forget that the railroads, for their services, receive approximately one-half of the gross earnings of the express companies, and share correspondingly in reductions made in express rates.

ADVANTAGES OF THE EXPRESS

Indeed, in correlating the many railroad lines into a unit of public service, similar in principle to the Pullman service, the express, in its usefulness as well as its need of public encouragement and support, is kindred to the railroad. The character and scope of the express, as we know it in its relation to the activities of our people, entitle it to be considered one of the greatest transportation agencies in existence. To the everlasting credit of the American people, be it said, it was also "Made in the United States." After three years of service with one of the largest of these companies, during which period the express has been, most of the time, under fire of both criticism and regulation, I am convinced that as a specialized personal service for the transportation of packages of all descriptions, combining the highest measure of safety, speed and responsibility, it has no equal anywhere. It is ideally adapted to, as well as a development of, the needs of the American people, and, in my judgment, the express is now giving a service which in expedition, correctness and reliability cannot be replaced to advantage, should it retire or be destroyed, nor can its place in business activity and promotion ever be satisfactorily filled by a governmental service.

Moreover, the unit of service supplied by the express through its unique organization as now constituted, would not be the same if each separate railroad operated its own express. This is true not only because of the difficulty of proper correlation, but on account of the duplication of service and the accompanying confusion and delay which would result if each railroad were obliged to provide its own separate express organization, including vehicles for pick-up and delivery service. On the other hand, the increased cost to the railroads of such a duplication of service, beyond their ordinary function of transportation, would be practically prohibitive. With very few exceptions—which are subject to special conditions—the railroads which have undertaken to operate their own express have abandoned the experiment because of lack of success in their own, as well as the public, interest. Such an unlimited extension of duplicate service as would be required if the individual railroads throughout the country were to handle the express direct would not only *not* bring a satisfactory solution of present problems, but would transfer them in an enlarged degree from the express companies to the railroads.

The express assumes the fullest carrier obligation of any system of transportation, in that it guarantees personal service from the door of the shipper to that of the receiver, between all principal points, upon the hundreds of millions of packages which move yearly, and 90 per cent of which traffic originates or terminates with business concerns. The shipments between individuals represent less than 10 per cent of the whole. The express service, in the main, is required to serve an immediate need either of food, fashion or other daily requirement of our people—a single messenger, as it were, carrying not one message, but a whole shipment, to Garcia—with the added guarantee of indemnity to the owner for damage or loss.

The express has no counterpart in any other country, except Mexico and Canada, and these were "Made in the United States." It has always been financially responsible. It has been the pioneer in transportation of money, gold, silver and currency. It serves the world through simple and effective forms of money orders and travelers' checks. It is a notable fact that, in Europe, at the outbreak of the war, the express companies were practically alone in paying cash to Americans traveling abroad. Their service in recovery of American baggage from the war zone in Europe constitutes a red letter chapter in reclamation work.

DEFECTS OF THE PARCEL POST

The following is quoted from an analysis of the relative merits

*An address delivered at the annual dinner of the St. Louis Traffic Club, December 18, 1914.

of the express and the parcel post made by one of the great merchant bodies of this country, viz.:

"The parcel post omits the following essentials of a complete service:

"1. It does not collect parcels.

"2. It does not give receipts.

"3. It does not provide indemnity for loss, except upon extra payment, and only to the amount of $50.

"4. It does not provide any indemnity for damage.

"5. It does not provide controlling records, by reason of which omission the volume of loss is increased.

"6. It does not provide special means of security for valuable parcels.

"7. It does not provide adequate protection against damage, but, on the contrary, promotes damage and loss by opening in transit.

"8. It does not provide for the transportation of a wide range of special commodities.

"Unless the parcel post removes these defects it cannot by any possibility fill the entire field of quick transportation. It can invade it to a considerable extent, but the service performed by it will be materially less efficient and less comprehensive than that now supplied by the express companies. . . . It would partially supplant an adequate service by an inferior service, and by compelling the express companies to retire by depletion of their traffic would leave a considerable part of the field without needed traffic facilities."

More than a hundred business organizations throughout the country have expressed to the President, Congress, the postmaster general and the Interstate Commerce Commission a protest against further extension of the parcel post, as being not only unnecessary in the public interest, but, on the contrary, inimical to it because of the danger of driving out a service of higher efficiency—namely, the express.

It has not been the position of the express companies, at least within my knowledge, to oppose a parcel post within logical limits. The present-day consensus of opinion of business interests of the country, however, as voiced by the organizations referred to, is that any extension beyond its present scope is neither justified by the country's need, nor by the ability of the parcel post to serve. On the other hand, they contend that because of the detrimental effect upon the greater and more essential service of the express companies, its further extension becomes an injury to the public instead of a benefit.

It is my conviction, based on careful observation, that the parcel post cannot, in its present form, and it is doubtful if it can in any form, handle to material advantage perishable shipments for farmers or other producers. It can never furnish that personal service in direct helpfulness to the grower and the producer which has always been a feature of the work of the express and which has now been extended, through food products departments, to bring into closer relation the producer and consumer, thereby contributing to the success of the widespread movement for a reduction in the cost of living. Our company has formed over one hundred buying clubs in New York City alone in which the express company makes the delivery in bulk to the store employees who constitute the clubs. As a means of economy, members of these clubs make the distribution between themselves.

The loss by the express to the parcel post is estimated to be about 15 per cent of its gross earnings of the year prior to the installation of the latter. These shipments represent mostly small packages of limited value, including practically all of the small package business for "rural free delivery."

During the two years of investigation of express rates and practices by the Interstate Commerce Commission a mutual understanding was reached between the express companies, the shippers and the commission for the adoption of improved methods of handling the traffic. To the co-operative efforts of the various merchant associations, in joint conference with the representatives of the express companies, much is due for the progress made in this direction, thereby insuring correctness and efficiency of service.

The criticism which preceded these mutual conferences, however, was a remarkable illustration of the extremes to which the pendulum of criticism can go and how easily it may go past the point of benefit and produce serious injury, as was reflected in the radical reduction in rates provided for in the order of the commission by which a new plan, as well as an entirely new basis of rates, was made effective on February 1, 1914. It is fair to say that in tariff simplicity and insurance of correctness in quoting rates the new plan is a great improvement over the old and, to that extent, as well as for the improvements made in methods of handling referred to, the commission is entitled to commendation both from the express companies and the shippers.

As to the reduction in the rates—the companies expressed willingness to make a substantial reduction in long-haul rates, but vigorously opposed the radical reduction in the whole fabric of rates proposed by the commission, which they anticipated would unjustly reduce the earnings of both the railroads and the carriers, and might wipe out entirely the net earnings of the express companies.

It was estimated by the companies at the time the order was issued that the reduction would amount to about 15 per cent of their total revenue on interstate traffic. This would necessitate securing a still greater percentage of increased business at the lower rates if the former gross earnings were to be maintained unless material reductions in expense were made, since if a greatly increased business should result, the handling expense would also be increased. It seemed to the companies that it would be exceedingly difficult, if not impossible, to secure such economies as would overcome the losses which the extreme reduction in rates must inevitably produce. In the meanwhile, the express companies, like all other transportation agencies, were confronted with an actual increase in their cost-of-living expense.

REDUCTION IN EXPRESS REVENUES

The result of nine months of operation under these reduced rates is now available. Five months were reflected in the figures of the fiscal year closing with June 30, 1914. Commissioner Decker, of the New York state commission, in his report to the recent meeting of the National Association of Railway Commissioners, called attention to the gross revenue loss in express earnings for that fiscal year. This amounted to $10,000,000 as compared with the previous year. The net income fell from $4,400,000 to $400,000, a decrease of about $4,000,000, or 90 per cent. The resultant loss to the railroads was approximately $5,000,000, being one-half the loss in gross express receipts.

In this report Mr. Decker stated: "It is, of course, too early to hazard an opinion based upon these figures that the express business of the country cannot be continued to be operated under present conditions, but all must concede that such figures constitute a basis for apprehension and for serious thought and consideration in the future in connection with further reports of financial returns. . . . We are likely to have under consideration in the comparatively near future the question of providing sufficient revenue for the continued profitable operation of the express service over railroads in the United States."

The effect upon the *net* earnings of the express companies of the existing situation is strikingly shown by the following: Out of each dollar received by our company from the public the profit fell from 6.33 cents for the fiscal year ending June 30, 1912, to 4.25 cents in 1913, and to 2.71 cents in 1914. For the first quarter of the current fiscal year the profit was less than *one cent* for each dollar received. The fiscal year ending June 30, 1913, included 6 months of parcel post, while that of June 30, 1914, included, in addition to 12 months of the parcel post, 5 months' operations under the new reduced express rates. The more significant effect of the rate reduction, however, is shown in the figures quoted for the first quarter of the current fiscal year.

On interstate traffic, the average charge per shipment of our company, from July to October, inclusive, of this calendar year, decreased 18.1 cents, or 16.55 per cent as compared with the same period of the previous year. In 25 of the larger cities east of the Missouri river our average charge per shipment decreased in October of this year from 85.8 cents to 70.8 cents, or nearly 18 per cent. St. Louis fell from an average of 90 cents to 72 cents, or 20 per cent. The average charge per shipment for the entire system, state and interstate, for the 4 months fell from 81.39 cents to 73.02 cents, a decrease of 8.37 cents per shipment or 10.28 per cent.

The problem at the moment, therefore, is one of preventing *deficits* rather than of showing profits. We must all agree, however, that if the express companies are to continue to serve their present useful function they must be conducted at a profit. It is by no means clear, in view of the present outlook, how this is to be accomplished.

NEEDS OF THE EXPRESS BUSINESS

Two things, however, seem reasonably certain: first, the express must respond to the demand of the public for a virile and aggressive administration such as will command both the respect and good will of the latter. It is our conviction that this obligation is now being fulfilled. It must also have an earning capacity that will insure to its stockholders a profit proportionate to its usefulness and value in public service and to the company the maintenance and improvement of its service, including the personnel and efficiency of its employees. The figures herein quoted show that such an earning capacity is now lacking. Second, the public must be responsive to the situation in protective support against measures for the extension of governmental competition which may weaken or destroy, but which cannot replace, the express service. There must, likewise, be a realization by the public not only of the necessity, but the merit, of compensation to the express commensurate to the specialized service and general usefulness which constitute its value as an essential agency of transportation.

I can at least speak for the company with which I am connected in saying that the problem of making income exceed the outgo has been undertaken with the spirit of accomplishment to the greatest extent possible. In the fiscal year ending June 30, last, our operation cost, through efficiency work, was reduced so substantially, as compared with the previous year, as to reflect a net earning which would not otherwise have been available.

We have made and will continue to make an earnest and conscientious effort to make the best of the rate bases which, by process of law, have been prescribed, however reluctant we were to adopt them as affecting our earning capacity, or how difficult seemed the task before us. We have approached the task with energy and even optimism, with a full appreciation of the stimulus to progress which is to be derived from such an attitude, especially in its effect upon our large force of officials and employees who, after all, are the men behind the guns in all such accomplishment.

We are striving, through efficiency and inventive effort, to find new or cheaper methods of handling. We are, however, constantly met with the fact that the specialized personal service and responsibility of the express necessitate such an extraordinary amount of detail in the speedy handling of not only the packages, but the way-bills and other safety records required, as to make it difficult to find new methods that are not fatally defective to this expeditious and insured service, which is the very essence of the express.

But in the effort being made by the express, notwithstanding the losses in earnings as a result of the reduction in rates, not only to keep up but to improve the service to the public, we must have constantly in mind our obligation to our stockholders. Express stocks are held just as are railroad stocks—by banks, insurance companies, trust companies, women, estates and even churches. With our company, women constitute approximately one-half our total stockholders. Our officials likewise feel most keenly their duty to our army of loyal and faithful employees. They regard it as a most worthy ambition to preserve to these employees their positions by the continuation of the express, and that we should not only be in a position to improve their working condition, but to extend our pension system and other methods of welfare work. By these means the express would continue to attract the grade of employees so essential to its highly specialized service—in which 150,000 persons are now employed in an operation of over 250,000 miles of railroad lines in the United States.

Without any thought of relief from the responsibilities which are properly ours, it seems to us that we may now with propriety bring to the public, whom we serve, an account of our stewardship and of the effect upon the earnings of the express, as well as those of the railroads, under the new conditions. In other words, the time for retrospection seems to have arrived. The public can with satisfaction view the results of its co-operative effort in the improved efficiency and usefulness of the express. At the same time the public may well be concerned as to the effect upon express earnings and the need of further co-operative effort in the providing of sufficient revenue for the continued profitable operations of the express service as one of the great transportation agencies "Made in the United States of America."

MICHIGAN CENTRAL STEAM-ELECTRIC WRECKING CRANE

A wrecking crane built to operate either by steam or electricity has recently been received by the Michigan Central for use in and adjacent to the Detroit river tunnel. This crane differs from the electric tunnel cranes of the Pennsylvania Railroad and the Grand Central Terminal in the provision for steam operation, and further in being single-ended. It is hoped, of course, that an accident may never occur in the tunnel itself,

New Wrecking Crane of 120-Tons Capacity Designed for Operation by Either Steam or Electricity

and in order that the crane need not be idle under normal conditions, it is adapted for ordinary uses outside the tunnel as well as the special use underground. When operated within the electric zone, current is supplied from the third rail or from a flexible cable carried on the crane. At points where the electric power is not available the crane can be operated by steam from any outside source, such as an accompanying locomotive, through a suitable system of piping. This makes it available for regular wrecking duty or for construction and yard work.

The construction of the crane is similar to that of the 120-ton

capacity steam wrecking crane used on many roads. The car body is 26 ft. long and 9 ft. 6 in. wide. The weight of the crane is distributed over a wheel base of 19 ft. 8 in. Telescopic outriggers are provided to add to the stability during heavy lifting. It is equipped with air and hand brakes, with provision for both automatic and straight air. The complete air brake system is under the control of the operator, with engineer's valve, electric air compressor, etc.

The electric motor is wound for 600 volts direct current, and has a capacity varying from 200 hp. for a short period to 115 hp. for one hour's continuous service. This motor will operate on fluctuations of line voltage between 300 and 700 volts. The controller is of the street railway type with cast grid resistance. The current is delivered from the third rail or cable to a switchboard that is furnished with all necessary switches and instruments for operating the electric air compressor, cable reel, third rail shoes, light, etc.

The main power cable is automatically paid out and reeled in. A reel is provided with a capacity of 500 ft. of insulated power cable, which is operated by a motor. The automatic control of the reel is secured by the action of this motor without the use of any intermediate or internal mechanical devices, such as friction, clutches, etc. This motor is supplied with current whenever the crane is taking current through the cable, so that practically a constant torque is exerted on the reel, resulting in practically a constant pull on the cable. Any change in this pull, such as would be produced by the crane moving forward or back, results in the automatic paying out or reeling in of the cable. The motor is capable of standing "stalled" continuously without danger to its parts from overheating.

When the crane is operated by steam the piping system is so arranged by means of a steam-tight slip joint at the center of revolution that the crane will slew more than 180 deg. in either direction under the pipes without interference. When the crane is operated electrically this piping revolves with the crane.

The motions of hoisting with either the main or auxiliary hoists, varying the boom radius, and slewing are independent of each other, and with loads up to the limit of its power the crane can perform all of these motions simultaneously. With the maximum load of 120 tons it is capable of slewing at the rate of a complete revolution in one minute if this speed is deemed safe. The boom may be raised or lowered under full load. A special drag or pulling line is attached to the underside of the boom. When self-propelled by either steam or electricity the crane has a speed of about four miles an hour, but it may safely be handled in regular trains over main line tracks at a speed of 60 miles an hour.

The maximum radius of the main block is 25 ft. and the minimum 16 ft. The capacities of the crane are as follows: With outriggers in position, main hoist, 240,000 lb. at 17-ft. radius or 160,000 lb. at 20-ft. radius; with end outriggers only, main hoist, 140,000 lb. at 16-ft. radius and auxiliary hoist, 30,000 lb. at 25-ft. radius; without outriggers, main hoist at right angles, 44,000 lb. at 16-ft. radius and 32,000 lb. at 20-ft. radius and auxiliary hoist, 24,000 lb. at 25-ft. radius. This crane was built by the Industrial Works, Bay City, Mich.

SWEDISH RAILWAYS PLACE ORDERS FOR NEW EQUIPMENT.—The Swedish state railways have recently placed orders, for 1916 delivery, with Swedish companies, for locomotives to the value of $250,000 and cars to the value of $700,000.

OPENING OF NEW SWEDISH RAILWAY.—The Alfsbyn-Pitea branch of the Swedish government railways was recently opened for provisional traffic. This line, the construction of which was begun in 1912, extends from Pitea, on the northern bank of the Pite river, to Sikfors, where it crosses the river and follows the valley of the Tvara for some distance up to Alfsbyn. The cost of the railway is estimated at $974,000. It is not yet entirely completed, several station buildings, in particular, being lacking or only partially finished.

DENVER RECLAIM AGREEMENT

The Colorado roads are now working under a new reclaim agreement for the guidance of car accountants in the settlement of bills for rental on freight cars switched by one road for another, which went into effect on January 1. This agreement has the distinction of being so free from objectionable or questionable features that *all* of the roads in the territory affected have unconditionally given their approval. The agreement is as follows:

AGREEMENT

OUTLINING BASIS FOR SETTLEMENT OF RECLAIMS UNDER PER DIEM RULE NO. 5*

FOR THE YEAR 1915 AND THEREAFTER UNTIL AMENDED.

Rules.

1. Reclaim statement must show initials and numbers of cars, date received, date delivered, and days on the line. Days on the line to be determined by subtracting the date of receipt from the date of delivery.

2. The average detention shall be determined from the cars that make round trip movements in switching service; that is, received from and delivered back to the same road, including cars that are received and returned the same day. Such average detention to be expressed in days and hundredths of days. Cars must appear on the reclaim statement for the month in which the loaded movement is made.

3. A car received with a switch load which is unloaded [and the car], reloaded within the switching limits, and returned to the same road, shall be counted as two cars and the total days shown subject to a maximum of ten days. An item of this kind is to be included in arriving at the average detention, as per Rule 2. The reclaim for both moves must be included in the month in which car was received.

4. The reclaim on cars picked up or diverted shall be on basis of the average as per Rule 2, but the number of cars so handled, and the days detained, shall not be used in computing the average.

5. In the event the average detention is five days or less, and no pick-up or diverted cars are in the statement, the reclaim will simply cover the actual per diem paid by the switching road.

6. Each month's business with each road shall be settled on its own basis. Per Diem Rule 5 provides for an arbitrary amount for each car in switching service, based on the average number of days, not to exceed five, actually required in switching service.

7. In arriving at the average detention, ten days shall be the maximum time figured on any one car.

8. Supplemental reclaims covering omitted cars shall be made on basis of the average time as shown by the reclaim statement from which the cars were omitted, and the average for that month shall not be refigured. Supplemental reclaims for cars included in error, shall be on basis of the actual number of days which were allowed on such cars.

9. No supplemental reclaim shall be made on account of error in date of interchange, discovered after reclaims have been settled.

The roads parties to the agreement are the following:

Atchison, Topeka & Santa Fe, all points in Colorado; Colorado Midland; Colorado & Southern; Chicago, Burlington & Quincy, all points in Colorado and Wyoming; Chicago, Rock Island & Pacific, all points in Colorado; Denver & Rio Grande, all points in Colorado; Denver & Salt Lake; Denver & Intermountain; Denver, Laramie & Northwestern; Florence & Cripple Creek; Great Western; Missouri Pacific, all points in Colorado; Union Pacific, all points in Colorado, and Cheyenne, Wyo.

*An arbitrary amount for each car in switching service may be reclaimed by each individual switching line from the roads for which the service was performed. This amount shall be based upon the average number of days, not to exceed five, actually required in such switching service, to be determined annually by an examination of the records of each individual switching line by the roads directly interested for each local territory. No reclaim shall be allowed for an intermediate switching movement. No reclaim shall be allowed under this rule to a non-subscriber.

Modernizing Locomotives on the Kansas City Southern

Comparative Tests of Consolidation Type Which Are of Special Interest from a Transportation Standpoint

The Kansas City Southern is one of the few steam roads that have taken up the matter of modernizing existing locomotives on a practical basis. The great improvements made in motive power equipment during the past five years have caused many locomotives built a few years previously to become quite expensive to operate as compared with locomotives of more recent construction. This is particularly true in view of the constantly increasing cost for fuel, water, engine and train crew overtime, car service per diem and like transportation expenses.

In order to bring its power that will remain in service for at least ten more years up to the present new locomotive standard of effective and economical working, the management of this road has recently made the following alterations in two out of a lot of forty-eight consolidation type locomotives, built in 1907-1908, and having the original general dimensions shown:

Item	Locomotive as originally built	Conversions	
		No. 477	No. 497
Fuel	Bit. coal	Bit. coal	Bit. coal
Tractive effort, lb.	44,880	44,880	44,880
Weight on drivers, lb.	182,650	186,000	185,000
Cylinders, diam. and stroke, in.	22 x 30	22 x 30	22 x 30
Drivers, diam., in.	55	55	55
Boiler pressure, lb.	200	200	200
Grate area, sq. ft.	33.5	33.5	62.5
Heating surface, sq. ft., total	3,039	2,831	2,907
Superheater	None	Schmidt, 32 unit	None
Valves	Slide	Universal Piston 8 in.	Slide
Brick arch	None	Security	None
Fire door opener	Hand operated	Automatic, Franklin Butterfly	Automatic, Franklin Butterfly
Cost to convert		$2,775	$4,850

From the foregoing data it will be noted that the changes made in locomotive 477 consisted of the application of a superheater, 8 in. diameter piston valve chests, brick arch and automatic fire door, while those made in locomotive 497 consisted of enlarging the grate area from 33.5 to 62.5 sq. ft., and applying an automatic fire door, the idea being to test these altered locomotives against each other in order to determine their relative hauling capacity, fuel, water and speed performances.

An exhaustive comparative fuel test has just been completed of locomotives 477 and 497 in tonnage freight service. This test was made during November, December and January, over a 102 mile freight division having a ruling grade of .5 per cent, compensated for 72 miles and 1.0 per cent compensated for 30 miles. The average results per round trip of 204 miles are shown in the accompanying table:

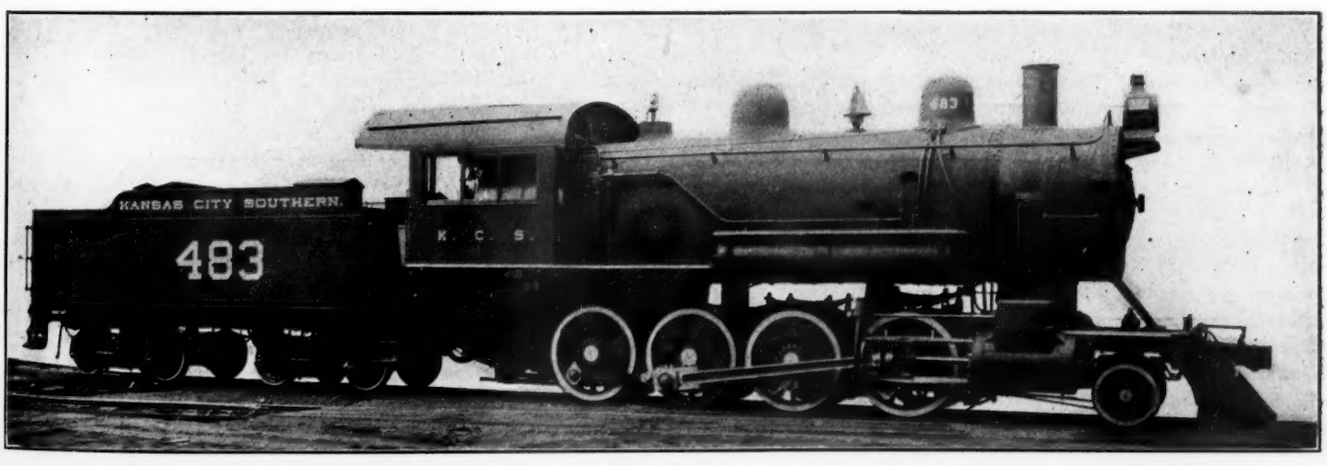
Results of Comparative Fuel Tests of Locomotives 477 and 497 on a Round Trip Basis

Item	Average performance 477	Average performance 497	Per cent in favor of 477
Weather conditions; temperature, max. and min.	71 deg.—41 deg.	71 deg.—29 deg.	.....
Ton-miles, total actual	418,157	413,094	1.23
Time in motion, total	12 hr. 1.6 min.	13 hr. 50.4 min.	15.08
Coal per mile, lb.	151.25	196.69	23.10
Water per mile, lb.	953.38	1,416.14	32.67
Coal per 100 ton-miles, lb.	7.378	9.718	24.08
Water per 100 ton-miles, lb.	46.508	69.934	33.49
Running speed, average m. p. h.	16.96	14.72	15.22
Equated result, lb. coal used per 100 ton-miles	6.507	8.602	24.34
Equated result, lb. water used per 100 ton-miles	41.736	68.265	34.03
Steam pressure, average, lb.	196.9	199.44	.....
Superheat, deg. F.—Max.	355	.....	.....
Superheat, deg. F.—Min.	65	.....	.....
Superheat, deg. F.—Average.	223	.....	.....

A comparative tonnage test was also made of the two locomotives over the same division in the direction of the flow of traffic against the maximum gradient, with the results per single trip of 102 miles given in the table:

Results of Comparative Tonnage Tests of Locomotives 477 and 497, on a Single Trip Basis

Item	Average performance 477	Average performance 497	Per cent in favor of 477
Weather conditions; temperature, max. and min.	45 deg.—42 deg.	49 deg.—41 deg.	.....
Ton-miles, total actual	275,418	238,716	15.4
Time in motion, total	7 hr. 21 min.	8 hr. 12 min.	10.6
Coal per mile, lb.	240.71	248.00	2.9
Water per mile, lb.	1,481.36	1,812.66	18.3
Coal per 100 ton-miles, lb.	8.914	10.596	16.0
Water per 100 ton-miles, lb.	54.862	77.452	29.1
Running speed, average m. p. h.	13.88	12.44	11.6
Equated result, lb. coal used per 100 ton-miles	7.881	9.604	18.0
Equated result, lb. water used per 100 ton-miles	49.053	71.399	31.3
Steam pressure, lb., average	198.1	199.3	.....
Superheat, deg F.—Max.	324	.....	.....
Superheat, deg. F.—Min.	134	.....	.....
Superheat, deg. F.—Average.	253	.....	.....



Kansas City Southern Consolidation Type Locomotive as Originally Built

The data in these tables shows that on a fuel test the percentages in favor of locomotive 477 were:

Ton-miles ..... 1.33 per cent increase
Running speed ..... 15.22 per cent increase
Fuel consumption ..... 24.08 per cent decrease
Water consumption ..... 33.49 per cent decrease

On a tonnage test the percentages in favor of locomotive 477 were:

Ton-miles ..... 15.4 per cent increase
Running speed ..... 11.6 per cent increase
Fuel consumption ..... 16.0 per cent decrease
Water consumption ..... 29.1 per cent decrease

On the basis of about the same tonnage hauled the average

saving in coal per round trip of 204 miles would approximate 5 tons, which at $2 per ton equals $10. Allowing 14 round trips per month, with one month out for general repairs, gives 154 round trips per year, which at $10 gives $1,540 saving in fuel cost per year. If capitalized this represents the interest at 6 per cent on over $25,000 per year. This leaves out of consideration the reduced cost for about one-third less water used as well as for probable less engine and train crew overtime due to the 15 per cent increased running speed. At any rate the cost for the conversion on a comparative tonnage and fuel saving basis will be more than paid for by the reduction in coal consumption during the first two years of service.

On the basis of the greater tonnage hauled, and assuming an average of one-third empty and two-thirds loaded cars per train, as well as an average of 21 revenue tons per loaded car, this would approximate an increase of 125 revenue tons and 25,500 ton-miles per round trip. Allowing a rate of 7.8 mills per revenue ton mile gives about $199 increased *gross freight revenue* per round trip, or for 154 round trips per year, a total of $30,646 increase in gross operating revenue. This still leaves out of consideration the 16 per cent saving in fuel and 29 per cent saving in water, as also the probable less engine and train crew overtime due to the 11 per cent increase in running speed. At an operating ratio of 63 per cent (exclusive of taxes) each locomotive converted in the way employed with No. 477 can increase the *net operating revenue* by at least $11,500 per annum, or over four times the cost for the conversion.

Therefore, while the cost to convert No. 477 ($2,775) was about 43 per cent ($2,075) less than for No. 497 ($4,850), its performance from either a fuel, a tonnage or a combination standpoint was much more effective and economical. As compared with the unconverted locomotives of the same class the saving in fuel will average from 25 to 30 per cent, and this, with the additional savings through increased average train load and running speed, less number of stops for water and fuel, decreased steam failures and overtime, all of which are reflected in reduced transportation expenses, has made the conversion of this class of power practically imperative.

The more effective and economical performance of locomotive No. 477 with 33.5 sq. ft. of grate area, as compared with No. 497 having 62.5 sq. ft. of grate area, was contributed to largely by the superheater and brick arch.

The application of the superheater to this locomotive without removing the existing slide valve cylinders and making an expensive renewal with piston valve cylinders, as well as alterations in the frames and auxiliary parts, was made possible by the use of the Universal piston valve chest, manufactured by the Economy Devices Corporation, 30 Church street, New York, and the effective performance of these 8 in. diameter piston valves is shown by the accompanying indicator diagrams. No trouble was experienced in the lubrication of the valves and cylinders with saturated steam valve oil under sustained temperatures of 700 deg. F. in the steam chest and on several occasions this temperature was increased with no damage to any of the wearing parts.

The Kansas City Southern is one of the few remaining dividend paying railways in the section of the country which it serves, and this plan that it has taken to substantially increase its earning capacity, for a relatively small expenditure on capital and maintenance accounts, will continue to improve the financial strength of the property, as well as its standard of operation.

ANTI-FULL-CREW LAW CAMPAIGN

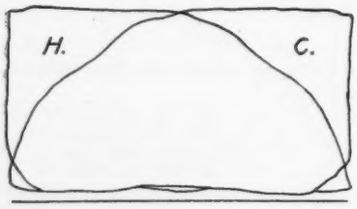
Messrs. Samuel Rea, president of the Pennsylvania Railroad; Daniel Willard, president of the Baltimore & Ohio; Theodore Voorhees, president, of the Philadelphia & Reading, and R. L. O'Donnel, chairman of the executive committee of twenty-one associated railroads of Pennsylvania and New Jersey, have issued a third circular answering an "Appeal to the Legislature," which has been presented by the Pennsylvania legislative committee of the trainmen's organizations. The trainmen's committee states that the railroads opposed the air brake law (in 1893); but with this statement of fact, says the committee, there is no issue. In the very first statement of the full-crew law matter, as given out by the railroads February 14, this fact of a dead past was frankly admitted, and stated far more strongly than the trainmen now put it. . . .

In their statement, the trainmen's legislative committee, referring to the beneficent results of air brakes in making railroad operation safer and more economical, declare that the full-crew law will have the same result. But, say the railroads, "The actual, not the theoretical result of railroad operation under full-crew laws, has been a large increase in the casualty list. This is particularly true as to the class of accidents which the trainmen have most emphatically asserted the laws would prevent—injury to passengers getting on and off trains. Figures at hand for fourteen of the twenty-one railroads operating in Pennsylvania and New Jersey show accidents as follows:

	Before law First six months of 1911		*Under law* First six months of 1914	
	Killed	Injured	Killed	Injured
Trainmen killed or injured by falling from trains, getting on or off trains, coupling or uncoupling, or doing other work on or about trains	45	2,307	30	3,008
Passengers, by falling from cars, or getting on or off cars	5	293	3	350
Total	50	2,600	33	3,358

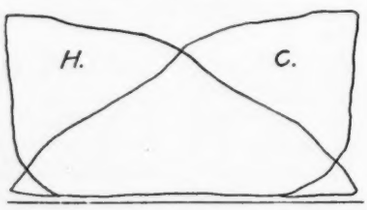
"The railroads did man trains for safety and efficiency of operation before the law required an arbitrary manning of trains, and they continue to do so now quite irrespective of the law's requirements. At the time the full-crew laws went into effect, eleven railroads were operating in Pennsylvania and New Jersey 276 passenger and 540 freight trains, or 816 out of 7,805 trains with crews larger than the law required. Today the same railroads are operating 316 passenger and 414 freight trains, or 730 out of a total of 6,853 trains, manned in excess of the full-crew law requirements. Thus when the trainmen say, as they do in their statement, that 'the full-crew law is not an experiment—is not an innovation in railroad operation,' they are entirely correct. The railroad managers, as a plain business proposition, had full-crewed all trains. The laws which were enacted had nothing to do with it, nor have they since. . . ."

Card No. 1



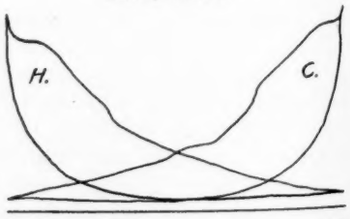
Boiler pressure, lb	200
R. P. M.	73.3
M. P. H.	12
Piston speed, ft. per min.	366
Total I. Hp.	1,318

Card No. 2.



Boiler pressure, lb	200
R. P. M.	91.6
M. P. H.	15
Piston speed, ft. per min.	458
Total I. Hp.	1,324

Card No. 3.



Boiler pressure, lb	200
R. P. M.	232
M. P. H.	38
Piston speed, ft. per min.	1,161
Total I. Hp.	1,418

Cylinders, 22 in. by 30 in.; diameter of drivers, 55 in.; piston valve diameter, 8 in.; tractive effort, 44,900; indicator spring, 100 lb.
Note: Cards Nos. 1 and 2 taken when locomotive was hauling 2,429 actual tons in 52 loaded cars on .5 per cent compensated grade.

Indicator Cards Taken from Consolidation Type Locomotive with Universal Valve Chests

Transportation Exhibits at the Panama Exposition

A Brief Description of the More Important Features of Interest to Railway Men, Showing Recent Developments

By William S. Wollner

The completion of the Panama canal marks an epoch in the history of transportation and in planning the Panama Pacific International Exposition in commemoration of this event, due notice has been taken of the important part that transportation bears to the manifold activities of this busy era. In opening its doors last Saturday, the San Francisco Exposition placed before the world the most complete exhibit of the progress of transportation methods on land and sea and in the air, that has ever been assembled, and railroad men will be particularly interested in the exhibits made by the different railway companies and by the railway supply and equipment houses.

The Palace of Transportation is one of the main group of exposition buildings surrounding the Court of Honor on one side and the Court of Abundance on the other. The building is of frame construction 617 ft. by 574 ft. 6 in. in size and contains 174,323 sq. ft. of exhibit space. The clear height in the main part of the building is 40 ft. and the center of the building consists of a dome 82 ft. in diameter, with a clear height of 87 ft. 5½ in.

Immediately under this dome and so situated that it is visible to the spectator from any portion of the building, is a 65-ft. steel deck turntable bearing a 4,000 h. p. articulated Westinghouse electric locomotive constructed for use in the Pennsylvania tunnels under the Hudson river and actually operated in this service for several years. The turntable is rotated by an electric motor driving through a series of reducing gears by means of rack and pinion and makes a complete revolution each minute. As the locomotive alone weighs 150 tons, a special foundation was provided for the turntable. The deck of the turntable is 12 ft. above the main floor of the building.

In the northwest quarter of the building, which is the part devoted to railroad exhibits, 14 standard-gage railroad tracks have been constructed of an aggregate length of 3,348 ft. The four tracks nearest the north wall of the building, 963 ft. in length, are built to carry a load of 5,000 lb. per lineal foot and the remaining ten tracks, 2,385 ft. in length, are constructed for a load of 12,000 lb. per lineal foot. All these tracks are carried on pile foundations and are connected with the Exposition railway system, which in turn connects with the State Belt railroad through which cars are interchanged with the various transcontinental roads. A transfer table has been installed for use in placing the various exhibits.

On track No. 1, immediately inside the main north entrance, are located the following cars of the Southern Pacific: A single-sheathed, steel frame automobile car of 80,000-lb. capacity, 44 ft. long, equipped with the latest type of end doors; a 100,000-lb. capacity double-sheathed steel frame box car; a single-sheathed box car of the same capacity and type, and an 80,000-lb. capacity Pullman stock car.

Track No. 2 carries the exhibit of the McCloud River Railroad Company, consisting of a complete logging train as used by that company on its lines in Northern California. The locomotive, which is of the type built specially for this road by the Baldwin Works, carries 90 tons on small drivers and weighs 120 tons in working order. Next to the engine is a flat car loaded with six white and sugar pine logs, 32 ft. long and containing an aggregate of 12,466 ft. of finished lumber. The second flat car carries 6 logs 16 ft. long containing an aggregate of 10,294 ft. of lumber. The next car is a box car containing rough lumber and the last car in the train is a caboose finished in white pine left in the natural shades. The entire train, with the exception of the locomotive, was built in the railroad company's shops, and by walking its length one may view the logs as they come from the woods, the rough lumber as it leaves the mill and the finished product, as it is used in the constructive arts.

The west end of tracks Nos. 3 and 4 carry the exhibits of the German-American Car Company, consisting of a cork insulated tank car especially designed for wine and mineral water; an acid tank car; a tank car for petroleum products, cotton oil, molasses, etc., and a tank car for vinegar, cider, wine, etc. On the east end of track No. 3 is located the latest type of refrigerator car used by the Pacific Refrigerator Express and a standard Southern Pacific steel postal car in which will be demonstrated the handling and sorting of mail as it is carried on in daily service on the various railroads. The east end of Track No. 4 is occupied by a new type of wine tank car built and used by the California Despatch Line. This car resembles a box car, but contains 6 redwood tanks of approximately 1,000 gal. capacity each.

American Locomotive Company

On tracks 11, 12, 13 and 14 the American Locomotive Company has four engines on display, and as these will probably be of especial interest to mechanical department officers and employees visiting the exposition some of their dimensions, etc., are here given. There are two tank locomotives, one of the 36 in. gage and one of 4 ft. 8½ in. gage. The dimensions of the standard gage engine are as follows:

Loaded weight	89,000 lb.
Wheel base, driving (also total of engine)	7 ft.
Diameter of cylinders	16 in.
Stroke of piston	24 in.
Type of valves	Slide
Outside diameter of driving wheels	46 in.
Driving wheel journals	8½ in. by 9 in.
Type of boiler	Straight top
Working pressure	165 lb.
Total heating surface	933 sq. ft.
Water capacity	1,300 gal.
Fuel capacity	2,500 lb.
Maximum tractive effort	18,710 lb.

The dimensions of the 36-in. gage engine are:

Loaded weight	37,000 lb.
Wheel base, driving (also total of engine)	4 ft. 9 in.
Diameter of cylinder	10 in.
Stroke of piston	16 in.
Type of valves	Slide
Outside diameter of driving wheels	30 in.
Driving wheel journals	5 in. by 6 in.
Type of boiler	Straight top
Working pressure	165 lb.
Total heating surface	408 sq. ft.
Water capacity	700 gal.
Fuel capacity	600 lb.
Maximum tractive effort	7,480 lb.

These engines have been displayed as the best type, as reflected by actual experience for contractors, quarry, mine and industrial plant service. To illustrate the best types of engines used in logging and freight service two Mikado locomotives are shown. The logging engine is one of the usual kind employed in various parts of the United States, but the freight engine was especially constructed for the Pekin-Kalgan Railway in China. The comparative dimensions are as follows:

Loaded weights—	Logging engine	Freight engine
On driving wheels	144,500 lb.	138,500 lb.
On leading wheels	16,500 lb.	17,500 lb.
On trailing wheels	29,000 lb.	30,000 lb.
Total of engine	190,000 lb.	186,000 lb.
Tender	100,300 lb.	110,400 lb.
Wheel base—		
Driving	13 ft. 6 in.	14 ft. 3 in.
Total of engine	29 ft. 6 in.	30 ft. 9 in.
Total of engine and tender	56 ft. 3¼ in.	57 ft. 11¼ in.
Cylinders—		
Diameter	20 in.	20 in.
Stroke of piston	28 in.	28 in.
Type of valves	Slide	Piston
Wheels—		
Outside diameter of driving wheels	48 in.	50 in.
Diameter of engine truck wheels	30 in.	30 in.
Diameter of trailing truck wheels	33 in.	36 in.
Diameter of tender wheels	33 in.	33 in.

	Logging engine	Freight engine
Boiler—		
Type	Straight	Straight
Working pressure	180 lb.	180 lb.
Total heating surface	3,092 sq. ft.	1,834 sq. ft.
Superheating surface	.....	358 sq. ft.
Tender capacity—		
Water	5,000 gal.	5,000 gal.
Coal	18,000 lb.	18,000 lb.
Maximum tractive power	37,500 lb.	34,300 lb.

BALDWIN LOCOMOTIVE WORKS

The Baldwin Locomotive Works display on tracks Nos. 5 and 6 is of interest to the railroad visitor as showing the best practice in locomotive building as adapted for different parts of the country and for different classes of service.

On the west end of track No. 5 is shown San Pedro, Los Angeles & Salt Lake engine No. 3708. This engine is of the Mikado type and was built for use in heavy freight service and in some classes of passenger service over heavy grades and on moderate speed schedules. The particular engine displayed is for use in passenger service and has driving wheels 63 in. in diameter and a tractive force of 51,000 lb. This engine has a special trailing truck designed so that the truck frame acts as the rear equalizer. Ragonnet power-reverse mechanism is used and the engine is equipped with a Vanderbilt type tender.

On this track is also located Atchison, Topeka & Santa Fe Pacific locomotive No. 3600. This is a single expansion engine using superheated steam and developing a tractive effort of 41,000 lb. The Baker valve motion and the Ragonnet power-reverse with a mechanical locking device are used. The rear truck is of the Rushton type with outside journals. Oil fuel is used in the service for which this engine is intended, which is transcontinental passenger service on the Pacific Coast Lines.

Chicago, Burlington & Quincy engine No. 6110 stands opposite the 3600 on track No. 6, and is an excellent illustration of the latest type of coal burning engine fitted with a Street mechanical stoker superheater, brick arch and combustion chamber. It has the 2-10-2 wheel arrangement and exerts 71,500 lb. tractive effort in heavy road service. It has been standard on the Burlington since 1912.

The Southern Pacific Mikado No. 3270, which is also shown on track No. 6, has as a special feature a vestibule connection on the rear end and a Hodges pattern trailing truck. In other respects it is similar to the other Mikados shown in this exhibit. The third engine on this track is a Mikado especially designed by the Baldwin people for logging service and bears their number 41710. It exerts a tractive effort of 27,000 lb. and will work on curves of 30 deg. The trucks are of the radial type, the front truck being center bearing and the rear truck side bearing; these trucks are equalized with the driving wheels so that each finds a bearing and carries its load in passing over uneven track.

On tracks Nos. 8 and 9 are shown the "Giant" and "Pigmy" of the locomotive world. These engines are displayed by the Southern Pacific and demonstrate the progress of locomotive building during the past 50 years. The "Collis P. Huntington," which is the pigmy of the exhibit, was operated over the lines of the Central Pacific during the early sixties, and the giant is a Mallet compound of the class that is being operated over this same stretch of track today.

The "Collis P. Huntington" is one of six engines purchased by the Central Pacific when its line was first put into operation. These were shipped "around the Horn" and arrived in San Francisco March 19, 1864, and were shipped to Sacramento by river boat. Of the six, the "Huntington" and the "Leland Stanford" are the only ones still in existence, the latter now being on exhibition in the museum of the Leland Stanford Junior University at Palo Alto, Cal. These engines are carried on two driving wheels 54 in. in. in diameter, and the weight on the drivers is 18,500 lb., the total weight being 39,000 lb. The total wheel base is 21 ft. 2 in. and the heating surface of firebox and flues 419 sq. ft. Compared with these dimensions are the following proportions of the Mallet, which is really two engines in one as it has two separate sets of cylinders, two sets of drivers, etc. This engine has an over-all length of 68 ft., exclusive of tender, a wheel base of 56 ft. 7 in. and a total heating surface of 6,786 sq. ft. It carries 395,300 lb. on the drivers, and has a total weight of 437,100 lb. when loaded. The "Collis P. Huntington" is mounted on a track composed of steel rails on redwood ties which rest on 30 in. of rock ballast. This track is protected with automatic block signals, so mounted that their operation can be fully observed by and explained to the interested visitor.

An exhibit of unusual merit is being made by the Southern Pacific in its engine No. 1457, which is also located on track No. 9 This engine has the coverings of its working parts "cut away" so that their operation can be seen as the machinery is electrically operated. Some of the parts cut away are the smoke arch about to the top of the cylinder saddle to give a view of the steam pipes, petticoat pipes and the front end arrangement, and through the steam chest, valve and a portion of the cylinder, 3 in. off center, to show the piston and valve action. There is a second cut through the center line of the dome, throttle valve and standpipe, and through the third course of the boiler, the shell plate being removed down to the throat sheet flange, giving a clear view of the water tubes, the staying on the water-leg and on the top.

This engine is of the eight-wheel model, with 73 in. drivers and cylinders 20 in. by 24 in. It carries 92,000 lb. on the drivers. The sectional work was done in the Sacramento locomotive shops of the Southern Pacific under the direction of the motive power department officers.

THE PENNSYLVANIA EXHIBIT

The exhibit of the Pennsylvania Railroad is the first one to be seen by the visitor as he enters the railroad exhibits from the center of the building. Immediately in the rear of the Westinghouse display the Pennsylvania has placed two standard all-steel passenger coaches in which will be displayed moving pictures of various trips that may be made over the Pennsylvania. These cars were built in the Altoona shops, and were run to San Francisco as a part of a regular passenger train. Upon arrival at the exposition, one side of each of the coaches was removed and the cars placed side by side on standard gage tracks with flooring and roofing connecting the open sides. At the close of the exposition these cars will be restored to normal condition and placed in regular service on the Pennsylvania.

In the rear of the cars will be displayed relief maps showing the territory traversed by the system, one of the city of Greater New York and models of the terminals in New York City and Washington, the proposed terminal in Chicago and Hell Gate bridge. The relief map of the Pennsylvania System is 26 ft. by 42 ft. and is said to be the largest relief map that has ever been constructed. It shows the country between the Atlantic ocean and the Mississippi river and from Chesapeake bay to Quebec. The model of Greater New York is 26 ft. square, and is said to be the second largest relief map ever constructed. All the large buildings, parks and places of interest are shown.

The entire Pennsylvania exhibit is surrounded by signal masts, such as are standard on their lines, and the iron railing is similar to that used around stations, etc. The furniture is of the standard used in the general offices of the company, and it is planned to place everything used in the exhibit, with the exception of the maps and models (which will probably be used for advertising service) in regular railroad service at the close of the exposition.

OVERFAIR RAILWAY SYSTEM

In order to facilitate travel between points within the exposition grounds there has been constructed a railroad known as the "Overfair Railway System," which in itself is a part of the transportation exhibit. This road is of 19 in. gage and is of 20-lb. rail laid on redwood ties in rock ballast. Besides the two terminals there are three intermediate stations on the line which is three miles long, including a one-half mile branch. Fifteen miles per hour will be the average speed over the line, which will be covered in from 10 to 15 minutes.

Trains will consist of an engine and 10 cars. The engine is of the Pacific type, 5.5 ft. tall and 25 ft. long, including tender,

will burn coal and will have cab of such size that the engineer and fireman can remain inside when the train is running. Its weight in running order is 12 tons. The passenger coaches are 42 in. wide and 20 ft. long. They will accommodate 16 persons, and are equipped with Pullman trucks, Westinghouse air brakes and Sharon couplers. During the construction of the road a work train was used consisting of flat and box cars and a switching engine. All the equipment was built at Oakland, Cal., by Louis M. MacDermot, who will be in charge of its operation.

OTHER EXHIBITS

The railways have many other exhibits scattered throughout the grounds, and there are many displays in the other exhibit palaces that will especially interest railroad men. The Santa Fe has a six-acre reproduction of the Grand Canyon of Arizona, and the Union Pacific has a four-acre replica of the Yellowstone Park and a full size reproduction of Old Faithful Inn. The Southern Pacific has its own building inside of the exposition grounds where tickets will be sold, information given and moving pictures of the system shown.

TRAIN ACCIDENTS IN JANUARY[1]

The following is a list of the most notable train accidents that occurred on railways of the United States in the month of January, 1915:

Collisions

Date.	Road.	Place.	Kind of Accident.	Kind of train.	Kil'd.	Inj'd.
*2.	N. Y. C. & St. L.. } Erie ..... }	Blasdell, N. Y.	xc	F. & F.	0	3
30.	Penn.	Sizerville.	xc	F. & F.	1	2

Derailments

Date.	Road.	Place.	Cause of Derailm't.	Kind of train.	Kil'd.	Inj'd.
†3.	St. Louis & S. F....	Olathe, Kan.	malice	F.	4	0
4.	Minn. & St. Louis...	Emmons.	acc. obst.	P.	0	13
12.	Phila., W. & B.....	Perryville.	acc. obst.	P.	1	1
†15.	Wabash	Runnells.	.....	P.	1	13
16.	Atlantic C. L.....	Deland, Fla.	cow	P.	0	1
19.	Seaboard	Osgood, N. C.	malice	P.	1	2
*20.	Southern	Warrenton.	b. rail	P.	0	5
22.	Southern	Claremont.	b. rail	P.	0	7
23.	Erie	Glen Eyrie.	neg.	F.	3	0
25.	Chicago & A.....	Wilmington.	b. rail	P.	0	0
27.	Wabash P. T.....	Bridgeville.	unx	P.	1	1
28.	Chicago, M. & St. P..	Pembine, Wis.	.....	P.	0	5
30.	Chicago, M. & St. P..	Oakwood.	b. wheel	P.	0	6
	Atlantic C. L.....	Callahan	unx	P	0	15

The trains in collision at Blasdell, N. Y., on the 2d, were an eastbound freight of the New York, Chicago & St. Louis and an eastbound freight of the Erie. The first mentioned ran past a signal indicating stop, and into the other, at the crossing of the two roads. Seventeen loaded cars were destroyed by fire, which started from an overturned stove in the telegraph office, which was knocked down by one of the derailed cars. Three trainmen were injured, one seriously.

The trains in collision at Sizerville, Pa., on the 30th were a southbound freight and a switching engine. Both engines were badly damaged and 15 cars were thrown off the track. One trainman was killed and two were injured.

The train derailed at Olathe, Kan., on the night of the third was freight No. 135, engine 1292. The engine was overturned and five cars were wrecked. The engineman and a brakeman on the engine, and two men riding in a car as custodians of livestock were killed. The derailment was due to a misplaced facing point switch, evidently turned, maliciously, after the train had passed the last automatic block signal.

The train derailed at Emmons, Minn., on the fourth, was a southbound passenger, and two passenger cars were badly damaged. Nine passengers and four trainmen were injured. The cause of the derailment was a loose switch, the bolts holding the switch rail having been cut off by a brake rod of the baggage car, which became loose and was dragged along the track.

The train derailed at Perryville, Md., on the 12th was northbound passenger No. 64. The locomotive was overturned and the engineman was killed. The fireman jumped off and was injured. The derailment was caused by a car door, lying on the track, which had fallen from a southbound freight.

The train derailed near Runnells, Ia., on the 15th, was a northbound passenger No. 1, and two sleeping cars fell down a bank. One passenger was killed and 13 were injured.

The train derailed at Deland, Fla., on the 16th, was northbound passenger No. 92, and the engine was overturned. The fireman was injured. The train, while running about 35 miles an hour, struck a cow on the track and the body of the animal was thrown against a switch stand in such a way as to allow the engine to split the switch.

The train derailed at Osgood, N. C., on the 19th, was southbound passenger No. 3. The engine was overturned. Three of the 11 cars in the train went off the rails. The engineman was killed and the fireman and one trainman were injured. The derailment occurred at a switch, and it is believed that the rails had been maliciously misplaced or loosened.

The train derailed near Warrenton, Va., on the night of the 20th, was westbound passenger No. 331. The baggage car took fire and was destroyed. Three passengers and two trainmen were slightly injured. The cause of the derailment was a broken rail.

The train derailed near Clarement, N. C.,., on the 22nd, was passenger No. 15, and two passenger cars were ditched. Seven passengers were injured, none seriously. The derailment was due to a broken rail.

The train derailed at Glen Eyrie, Pa., on the 23rd, was a westbound freight, and the locomotive was overturned and fell down a bank to the Lackawaxen river. The engineman, fireman and one brakeman were killed. The train was moving on a passing siding and went over an open derail.

The train derailed near Wilmington, Ill., on the night of the 25th, was westbound passenger No. 5, and three cars were overturned. No injuries reported. The train, running at 45 miles an hour, was thrown off the track by a broken rail.

The train derailed near Bridgeville, Pa., on the 27th, was an eastbound local passenger. The engine was overturned, causing the death of the engineman and slight injury of the fireman. The tender was the first vehicle to leave the rails.

The train derailed near Pembine, Wis., on the 28th, was a southbound express passenger and three sleeping cars fell down a bank.

The train derailed on the Chicago, Milwaukee & St. Paul, near Oakwood, Wis., on the 30th, was a northbound express passenger, and the engine and first three cars were overturned. Six passengers were injured. The cause of the derailment was a broken wheel.

The train derailed at Callahan, Fla., on the 30th, was southbound passenger No. 85. Fifteen passengers were injured, but none very seriously.

[1]Abbreviations and marks used in Accident List:

rc, Rear collision——bc, butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail——Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

NEW RUSSIAN RAILWAY.—It is reported that the Russian Government has decided to build immediately a railway from Petrosavodsk (north of Petrograd) to the Bay of Sorotsk, on the White Sea. The probable cost is $8,750,000.

THE LONDON "TUBES" AND AIR RAIDS.—Gates are now being placed at the top of the stairways at the various "tube" stations in London supposedly for the purpose of regulating the traffic in the event of an air raid and a sudden rush for safety to the Underground. The employees have already received full instructions as to what they shall do in cases of emergency, and a system of private telephones has been installed communicating with all the departments concerned.

Appraisal of the Pere Marquette Lines in Michigan

Abstract of a Report to the Railroad Commission by M. E. Cooley, Based on a Careful Field Inventory

Prof. M. E. Cooley has recently completed an appraisal of the Pere Marquette lines in Michigan and submitted a report to the Michigan Railroad Commission. The following information is abstracted from the report:

The Pere Marquette embraces properties in Michigan, Ohio, Indiana, Illinois, Wisconsin and Canada, with 2,966.87 track miles in the system. The cost as found, to reproduce these properties as of July 1, 1914, is $96,962,771, and this cost less depreciation, $78,545,241.

In Michigan there are 1,823.88 miles of first main track, 59.87 miles of second main track, and 703.04 miles of side track. Outside of Michigan there are 251.83 miles of first main track, 0.55 miles of second main track, and 127.71 miles of side track. The reproduction cost new of road per mile (first and second main track), including equipment is $45,151 in Michigan, and $55,755 outside of Michigan. These costs less depreciation are $36,422 in Michigan and $46,512 outside of Michigan. For the entire system the cost per mile of road is $45,392, and this cost less depreciation, $36,770.

It will be of interest to compare the results of this appraisal with those obtained in the appraisals of 1900, 1902 and 1905. In the appraisal of 1900 the object was to determine whether it would be advisable to go from a specific to an ad valorem basis of taxation. Prices for materials and labor were taken as an average for 10 years (1890-1900) in order to cover periods of business depression and prosperity. The 1902 appraisal was for the purpose of fixing values as of a particular date, that of the assessment under the ad valorem tax law passed by the legislature of 1901. The 1905 appraisal was to determine the propriety of the values assessed that year by the state board of assessors. The 1900 appraisal was made under the direction of the state tax commission and the 1902 and 1905 appraisals under the direction of the attorney general.

In the earlier appraisals the properties known as the Detroit Union Railroad Depot & Station Company, and the Fort street Union Depot Company were valued separately and not included as Pere Marquette Railroad property. In the 1914 appraisal, 51 per cent of the latter company is included as Pere Marquette property, both real estate and other physical items. The value of tracks and other structures on the land owned by the Detroit Union Railroad Depot & Station Company is also included in the 1914 Pere Marquette appraisal; however, no value is included for the land, as it is all owned by the Detroit Union Railroad Depot & Station Company.

To make the 1914 appraisal comparable with the earlier appraisals the value assigned to each of these companies has been deducted from the total Pere Marquette value in Michigan. Cash and current assets, working capital, and stores and supplies have also been deducted. The comparisons are given in the following table, only Michigan properties being considered.

PERE MARQUETTE APPRAISALS OF DIFFERENT YEARS

Year	Main track miles	Cost of reproduction, new	Per cent condition	Cost of reproduction, less depreciation
1900	1,498.56	$36,543,130	78.70	$28,769,972
1902	1,732.69	43,520,470	79.96	34,798,973
1905	1,859.72	50,871,701*	83.35	42,403,309*
1914	1,883.75	79,851,210	80.58	64,349,449

*Does not include floating equipment, for which in 1902 the cost of reproduction was $1,412,000, and this cost less depreciation, $942,340.

Perhaps the most obvious reason for the marked increase in the 1914 appraisal over former appraisals is the greater care taken in making it. In 1900 the entire appraisal of all the railroads of Michigan, embracing a total of nearly 11,000 miles of track, was practically completed in 120 days. While more time was taken in the 1902 appraisal, the roads were not reinspected, and the appraisal of that date was based primarily on the 1900 appraisal. The same is true of the 1905 appraisal, except that the work was completed in about one month's time.

In the 1914 appraisal of the Pere Marquette system alone, embracing a total of nearly 3,000 miles of track, more than six months have been given to the work, with a force larger even than that used in 1900. Ten parties of three men each were engaged three months on track inspection, and six parties of three men each four months on earth work. Each of these parties was in charge of an experienced railroad engineer, his instructions being to do the work with such care as would enable him to testify in court as to its correctness. The same care has been used in collecting the data on mechanical and marine equipment, and in the land department work.

While there has been some increase in track mileage it alone answers for only a relatively small part of the total increase in value.

MILEAGE IN MICHIGAN

Year	1st Main track	2nd Main track	Side track	Total track
1914	1,823.88	59.87	703.04	2,586.79
1900	1,647.86	2.00	701.47	2,351.33
Increase	176.02	57.87	1.57	235.46

Among the things which have increased the value of the properties are many additions and betterments. Hundreds of old wooden bridges have been replaced by modern steel-concrete bridges; hundreds of miles of main line track have been relaid with 75, 80 and 90-lb. rail, taking the place of 56 and 70-lb. rail used in 1900, 1902 and 1905; automatic block signals have been installed on a part of the system; large additions to facilities for doing business have been built, as well as many hundreds of new buildings, including coaling stations of modern type and the new shops at Wyoming. These improvements represent in the aggregate very large sums.

The mechanical and marine equipments have been largely increased. The locomotives, for instance, while increased only a few in number are much more powerful. Due to their increased tractive power, the 468 locomotives of 1913 are equal to 592 locomotives of the average capacity used in 1905. This is equivalent to an increase of 141 locomotives, or 31.26 per cent. Expressed in dollars the comparison between the locomotives of 1905 and 1914 is as follows:

COMPARISON OF LOCOMOTIVES IN 1914 AND 1905

Year	Cost of reproduction, new	Cost of reproduction, less depreciation	Average cost per 1,000 lb. tractive power: Cost of reproduction, new	Average cost per 1,000 lb. tractive power: Cost of reproduction, less depreciation
1914	$5,440,092	$3,908,815	$440	$315
1905	3,724,782	2,856,703	393	301
Increase	$1,715,310	$1,052,112	$47	$14
Per cent increase	46.05	36.83	11.96	4.65

The investigation of land has been very complete and thorough, as the recent decision of the United States Supreme Court in the Minnesota Rate Cases seemed to make unusual care necessary. Since 1905 the value of Pere Marquette real estate in Michigan has increased nearly $5,000,000.

RIGHT OF WAY VALUES

Year	Cost of reproduction, new	Cost of reproduction, less depreciation
1900	$3,563,521	$3,563,521
1902	4,570,436	4,570,436
1905	4,570,436	4,570,436
1914	9,536,271	9,536,271
Increase since 1905	$4,965,835	$4,965,835

Perhaps the most conspicuous example of difference between the 1914 appraisal and former appraisals in the value of the road

will be found in the grading. As a basis for computing earthwork in 1914 actual measurements were made in the field, while the former appraisals approximate data had to be used. The company had no records of the amount of earth actually moved. The earlier appraisals were therefore based on profile estimates for a part of the lines, and for other parts on field estimates made by an engineer going over the road at the rate of 12 or 15 miles a day, estimating mile by mile without measurement. This year the field parties cross-sectioned all earthwork at frequent intervals. It is interesting to note that on such sections of the road as it was possible to check with the original quantities it was found that the 1914 estimates were within 2 or 3 per cent of the actual quantities paid for.

The grading in the different appraisals for Michigan property only is given in the accompanying table. Since 1905 the value of the grading has increased nearly $6,000,000.

GRADING VALUES—LINES IN MICHIGAN

Year	Cost of reproduction, new	Cost of reproduction, less depreciation
1909	$3,537,836	$3,537,836
1902	4,216,612	4,216,612
1905	4,300,944	4,300,944
1914	10,251,354	10,251,354
Increase since 1905	$5,950,410	$5,950,410

Note: Nothing has been added to cover up appreciation, due to solidification and surface improvement.

There are in the main tracks of the Pere Marquette in Michigan today 5,733,600 ties, and in side tracks 1,806,300, or a total of 7,539,900 on all tracks in Michigan. A comparison of their value in the different appraisals is given in the accompanying table. The increase in the cost since 1905 is about $2,500,000, and in cost less depreciation, $1,500,000.

TIE VALUES

Year	Cost of reproduction, new	Cost of reproduction, less depreciation
1900	$2,492,248	$1,381,331
1902	2,459,722	1,329,436
1905	2,828,680	1,528,851
1914	5,392,598	3,022,979
Increase since 1905	$2,563,918	$1,494,128

During the last 10 years all railroads have been laying heavier rails. This increase has amounted to from 20 to 40 lb. per yard. As the new and heavier rails has been laid on the main lines the rail taken up has been placed on the branch lines and side tracks. This means that a general increase of about 30 per cent in the weight of rail has been made on all classes of tracks. The Pere Marquette has been making such changes until at the present time the main line from Detroit to Chicago, except about 50 miles, is entirely laid with 90-lb. rail where formerly the weight varied from 60 to 70 lb., and the latter rails are now doing service on secondary main lines or on branches. At the present time there are 268,846 tons of rails on the Pere Marquette in Michigan, an increase of approximately 50,000 tons since the 1905 appraisal.

The increase in tonnage of rails, together with the higher prices, represent an increase in cost of approximately $2,000,000 since 1905.

RAIL VALUES

Year	Cost of reproduction, new	Cost of reproduction, less depreciation
1900	$5,831,764	$4,181,001
1902	6,067,464	4,361,823
1905	6,168,588	4,434,520
1914	8,198,132	6,158,913
Increase since 1905	$2,029,544	$1,724,393

Even more conspicuous than the grading schedule is the equipment schedule in which the increase in cost since 1905 is nearly $7,000,000. The locomotives account for nearly $760,000, freight train cars, nearly $3,200,000, passenger train cars $550,000, and floating equipment, $2,380,000. It should be noted, however, that in the 1905 appraisal no schedule of floating equipment appeared. For the different appraisals a comparison of the equipment values is given in the accompanying table.

Summarized these five principal increases since 1905 amount to $22,443,445 in the cost of reproduction and $16,300,780 in this cost less depreciation.

Important items in the 1914 results are the increases in the costs of materials and labor. The general effect of these increases is so well known as to require no particular explanation. Another item is that in the earlier appraisals the cost of transporting construction materials to the places of their use was not included, or at least not in any adequate amount. In the 1914 appraisal, these costs were made the subject of special investigation, and found to be far greater than any allowance made for them in former appraisals. Likewise, as the result of special investigation, it was found that the actual costs of many items as shown on the books of the company included only a part of the expense; for instance, the cost of concrete in bridge abutments was shown at only the contractor's figures, which did not include transportation of materials, sheet piling if required, or unwatering, nor did it include the transportation of men, and many other things which it has been customary for railroads to do in connection with building operations. That is to say, railroads have in the past charged to operation many items which properly were chargeable to construction.

EQUIPMENT VALUES

Year	Cost of reproduction, new	Cost of reproduction, less depreciation
1900	$7,798,021	$5,166,432
1902	10,681,551	7,394,983
1905	14,147,357	11,308,344
1914	21,081,095	13,474,358
Increase since 1905	$6,933,738	$2,166,014

In a number of important railroad appraisals in other states 10 per cent has been added to the grading schedule to cover appreciation due to solidification and improvement of surface due to sinking of ballast. Nothing has been added in this appraisal. If done it would add $1,025,135 to both the cost of reproduction and to this cost less depreciation.

Not all of the properties of the Pere Marquette, however, show marked increases in the 1914 appraisal. Some of the branch lines stand but little above the figures of the earlier appraisals.

In some instances the properties are not being maintained at former values. For example, the docks and wharves in 1905 were appraised at a cost of reproduction of $335,040, this cost less depreciation being $246,336. In the 1914 appraisal the corresponding figures are $219,949 and $148,876 respectively.

In view of the general impression that the Pere Marquette Railroad is in poor condition the following table has been prepared in which the per cent condition is given for a number of the principal physical elements. A comparison is made with the average condition found for the same elements in the 1900 appraisal for the Pere Marquette Railroad system and also for the Michigan railroads in 1900. In general it will be found that they are higher.

PERCENTAGE THAT PRESENT VALUE BEARS TO COST OF REPRODUCTION FOR CHARACTERISTIC PHYSICAL ELEMENTS

Account	All Michigan railroads, 1900	Pere Marquette,* 1900	Pere Marquette, 1914
Bridges, trestles and culverts	78.96	77.61	84.75
Ties	55.20	55.42	56.06
Rails	**76.18**	**71.68**	**75.13**
Station and office buildings	75.72	72.35	70.21**
Shops and enginehouses	68.03	65.35	76.53
Steam locomotives	56.44	61.89	72.41
Passenger train cars	71.22	68.72	71.01
Freight train cars	69.37	68.61	60.81

*Obtained by combining the cost of reproduction and the present values, respectively, of the various lines constituting the Pere Marquette System.
**Includes roadway buildings.

Attention should also be called to the so-called overhead charges. In general they are less in the 1914 appraisal than in former appraisals, due primarily to the fact that the greater amount of time available in 1914 made it possible to make more complete inventories, to work up unit costs more carefully, and to make investigations fixing more accurately a number of the individual percentages. In general the overhead charges in the 1914 appraisal aggregate about 15.4 per cent on the entire property, as against 18.4 per cent in former appraisals.

WIRELESS TELEGRAPH ON THE LACKAWANNA*

By L. B. Foley

Superintendent of Telegraph, Delaware, Lackawanna & Western

The Lackawanna first made experiments with wireless in 1909. During the early part of 1913 towers were erected at Scranton and Binghamton. On November 28, 1913, train orders were transmitted between the two points and messages were first transmitted to and from trains and fixed stations at Scranton and Binghamton three days later.

We now have stations equipped with Marconi apparatus as follows:

	Call.	Wave Length Meters.	Height of Tower. Feet.	Capacity of Station. Kilowatts.
Hoboken	WBU	3,000	402	5
Scranton	WPT	3,000	175	2
Binghamton	WBT	1,800	165	2
Buffalo	WBS	1,600	150	2
Limited, Train No. 3	WHT	600		1
Limited, Train No. 6	WBG	600		1

The wireless apparatus on the train is similar to that at the fixed stations. The motor generator, operated on 30 volts direct current from the car-lighting generator, draws about 40 amperes, and provides 500 cycle alternating current at 250 volts for the radio transmitter. The antenna current is about 35 amperes.

We can communicate from a moving train to a fixed station 130 miles away, but are able to receive messages on the train from a fixed station 200 miles distant. The aerial on the train is a phosphor bronze wire arranged in rectangles, one running lengthwise above the roof of each of four cars, with an additional wire lengthwise. These wires are parallel with the top of the car, and 18 in. above it, each rectangle being carried on porcelain insulators at the corners and center of each car, with wire link connections between the cars. The lead is taken from the middle of the antenna through the side of the car near the roof into a compartment two by four feet, which contains the apparatus and the operator.

After the first trip it was found that there was no interference with signals. The speed of the train, or its change of direction, has no effect on the transmission or reception of messages, and communication to and from the train is not retarded while the train is passing through tunnels.

The train radio service has been used for such purposes as reporting the number of passengers on board destined to connecting lines, providing additional cars, or cutting out cars at division points, or ordering an ambulance for persons taken ill on the train. Commercial telegrams are sent for passengers. The wireless telegraph serves as an auxiliary means of communication in the event of interruption to wire facilities, and has already proved its practicability and efficiency under such conditions. The wireless office at each division point is located near the despatcher's office, and in case of total wire failure the wireless is resorted to immediately for communication between the stations named above.

The cost of installation is not prohibitory, considering the advantages to be gained in having a means of communication which can be relied upon when all other sources fail. In 1914 we had a storm in March that completely wrecked pole lines in New York, New Jersey and Pennsylvania, and the only communication we had for 10 days was the wireless. Again, early in December, there was a severe ice storm, and there was absolutely no wire communication in this territory for three days. We had to depend on the wireless, and obtained entirely satisfactory results.

That we are obliged to carry an operator on each train equipped with wireless has led us to take up the wireless telephone. We have obtained some favorable results, having talked from a fixed station to a moving train a distance of 53 miles. The wireless telephone requires 110 volts, and we were obliged to install a 5-h.p. steam turbine in the baggage car, taking steam from the locomotive. In the front end of the car, next to the baggage car, is a small compartment for the apparatus and attendant. The transmitter resembles the quench spark wireless telegraph, and requires no attention after being set to the desired wave length. When adjustments are made to the required degree for receiving in tune with a particular station wave length, no other station can pick up. We have made a number of trips with our installation and have transmitted the voice from trains to fixed stations 15 to 25 miles distant. The wireless telephone is being developed slowly but surely.

Discussion. The paper was discussed by several members. It was the general opinion that the wireless was a useful auxiliary as an insurance against total loss of means of communication when the pole lines were crippled by a severe storm. As such storms occur so seldom, it was doubted, however, whether the use to be obtained from the wireless was sufficient to make the expenditure for it worth while. Several speakers expressed the view that there was little or no advantage in using a wireless telegraph for train despatching except when the wire lines were crippled; and it was conceded that the wireless telephone had not yet reached a practicable stage.

*Abstract of a paper read before the New York Railroad Club on February 19.

THE RUSSIAN BATH TRAINS

Soon after the outbreak of the war the Russian Imperial Ministry of Ways of Communication, formed a committee to superintend the distribution of a fund subscribed by the railway officers and employees for aid to the sick and wounded. The Russian peasant is accustomed to take his vapor bath every Saturday, and the absence of this comfort was keenly felt. One of the achievements of the committee has been to equip a number of bath-trains for the soldiers at the front.

Each of the three trains which have thus far been despatched to Poland is composed of over 20 cars, including four bath cars, subsidiary cars for disinfecting garments and ridding them of vermin, a refreshment car and cars containing supplies of clean linen. In the bathing car it was necessary to provide baths for the greatest possible number at the smallest expenditure of water, for often there is difficulty in getting a supply of water at all. A combined shower-bath and vapor system has been used, the equipment being simple, inexpensive, and economical in time and water, and offering the least danger of infection. The bath car is a large Pullman car divided into two compartments. The larger of these contains 21 shower baths, disposed along the walls, and a number of wooden benches. The smaller compartment forms the vapor bathroom and is provided with three shower baths; fixed to the walls are wide shelves on which the soldiers lie. The car accommodates 24 soldiers at a time and the whole set of four cars a total of 96. The walls are double-panelled and insulated by a layer of felt so that the temperature may be maintained at 69 deg. C. The floor, the ceiling and the upper part of the walls are lined with linoleum, and the lower part of the walls with zinc panels. The water drains off through a sink in the body of the car. The bath cars are connected at one end by means of gangway bellows with two cars where the men undress, and at the other with two others where clean linen and the disinfected overclothes are put on. Each of these cars accommodates 48 men and the walls and flooring are identical with those in the bathing cars.

The cars for disinfecting clothes and getting rid of the vermin form an essential part of the train. Superheated vapor and formalin are used for disinfectants. The disinfection car is divided into three parts, these being, respectively, a room for cast-off clothes, the disinfecting chamber proper and a space where clean clothes are dried. As the car is not sufficiently large to provide for all the bathers, and since the clothes are turned out in a wet condition and require some time to dry, only such clothing as is infected passes through the car, the rest being merely sent to the chamber where the vermin is destroyed.

The next car is a tea room, which is fitted with tables and benches and can accommodate from 80 to 96 men at a time. The dining car is composed of two sections, the first forming the dining room proper for the staff of the train and the second

the kitchen. The officers of the staff are lodged in a special compartment car and the rest of the crew in a third class car.

There are also two more cars; one fitted with closets and chests containing a supply of clean linen and the other carrying the soiled linen, which is deposited at one of the laundries which the committee has established at various places. The train itself and the hot water used in the baths are heated by a superannuated eight-wheel locomotive.

About 2,000 soldiers can be accommodated in the course of one working day of 18 hours. The soldiers are first sent to the undressing rooms where every man gets a ticket and two bags marked with the same number, one for his cast off linen and the other for his outside clothes; these are then carried, respectively, to the disinfection chamber and the soiled linen car. Each man has his hair cut by the barber, after which he proceeds to the bath car, where he is given some soap, a brush and a brass wash basin. When he returns to the dressing car he is supplied with clean linen and given his outside clothes, the latter having been mended if necessary. He is then sent on to the tea room and he is provided with hot tea, sugar, bread and tobacco. The equipment of one of these trains costs about $30,000. The total cost of operating it, including the supplying of the clean linen, is $46,000 a month.

We are indebted to the staff of the Russian Imperial Minister of Ways of Communication for the above information.

AN ENGLISH EXPERIMENT IN RAILROADING

As has several times been noted in these columns, the railways of Great Britain are now under government control and are being operated by a committee of general managers. The government has agreed to pay for the services rendered to it a sum sufficient to make the net revenues practically the same as before the war. The following comments on the way the plan is working out are taken from a letter from a London correspondent of the New York Times' Annalist:

What has been the effect of government control on the earnings of the railways and on the services given to the public? Concerning the former little can be said. The railways have been relieved from the obligation to publish full accounts, which, in view of the arrangement with the government, would be farcical. They have for the same reason ceased to publish the usual weekly returns of approximate gross earnings which formed some guide to the stock exchange of the intrinsic merits of their different stocks. In regard to the services to the public, reliable information is scarce. Freight cars have been rushed from the military bases to the ports, and the process of bringing them back empty has not been too well handled. This, however, may be due to dislocation of the ordinary trade channels, not to mismanagement.

Passenger services, except with the continent, have been maintained fully at the ordinary winter standard, restaurant and sleeping cars running as usual, as well as excursion trains. The only exceptions have been the services to Ireland, which have been reduced owing to the absence of suitable steamships, many of the usual vessels having been taken over as hospital ships or transports. Also certain suburban and underground services have been reduced in London, owing to the earlier hours kept by the inhabitants. On the other hand, some special holiday facilities, which usually end in September, were kept on till November because so many folk had postponed their holidays at the outbreak of war. It is anticipated that this summer the services will be extended as usual.

Efficiency of running trains has on the whole not been so good as in peace time, but it does not appear that this is due to state control. Occasionally, when another 40,000 troops or so, with big guns, ammunition, and impedimenta, go to France, or India, or Egypt, the ordinary traffic on certain sections may be held up. The actual embarkation of troops at Southampton and other ports has been performed with great efficiency. The trains usually come alongside the steamer, discharge their contents, and make room for a successor, in about 12 minutes. This is one of the few departments where the British have little to learn from other peoples; the process is so familiar, owing to the frequent movements of troops overseas in peace time, and the men in charge have three years' experience of the South African war to help them, so that muddle is rare. The melancholy reverse process of bringing back the special hospital trains of wounded is equally well done. There have, however, been rather more accidents than was to be expected since the war began. The cause of this seems to be shortage of labor. There are 600,000 railway men approximately in the country, of whom 70,000 are now with the colors. Enlistment from among them is now being discouraged, but even the places of the 70,000 have proved hard to fill. Thus boys and other untrained persons have often to be employed, with the results that inevitably follow the use of inefficient labor.

Replacement of freight and passenger cars does not appear to be going on as rapidly as usual. Shortage of labor is here the cause again, not economy, for from the shareholder's point of view economy in repairs paid for out of revenue is no advantage, because the government makes up the difference in net receipts, as already described. Moreover, some of the railway manufacturing centers (which are controlled by the railways themselves to a very large extent) have been transformed into armament works.

VACUUM PAINT SPRAYER

The paint sprayer shown in the accompanying illustration is operated by means of a vacuum created in the delivery pipe. The paint is contained in the can under atmospheric pressure, and is drawn up into and through the nozzle by means of air pressure passing over a series of holes in the nozzle. The quantity of paint is regulated by the air valve, as shown in the illustration, and the sprayer itself is controlled by a push valve which controls the flow of air. Air at the ordinary shop pressure may be used to operate this machine, and its construction is of such a simple nature that it may be used by unskilled labor. The only precaution necessary in using this machine is to be sure that it is thoroughly cleaned, after being used, either by turpentine or by benzine, in order that the atomizer may not become clogged with the paint, which would otherwise harden while the machine is idle. The sprayer is sold by the Gustin-Bacon Manufacturing Company, Kansas City, Mo.

Vacuum Paint Sprayer for Railroad Work

General News Department

The seventh annual convention of the American Railway Tool Foremen's Association will be held at the Hotel Sherman, Chicago, Ill., July 19 to 21, inclusive.

In the federal court at Savannah, Ga., February 17, fines for violation of the safety appliance laws were imposed on the Georgia Coast & Piedmont, and on the Savannah & Statesboro railroads.

The Senate Committee on appropriations does not approve the amount named by the House—$3,000,000—in the sundry civil bill for valuation of railroad property, and has changed the amount of $1,900,000.

The New York legislature is likely to repeal the "full-crew" law of that state. The Senate Republican caucus, which is understood to reflect the views of a large majority of the members of both houses has voted in favor of the Spring-Conkling bill, which would repeal the law. In New Jersey a resolution has been introduced to appoint a special committee of nine members to investigate the claims of the railroads in favor of repeal and of the brotherhoods against it.

"Swinging on" freight trains after they have been set in motion is discouraged by the Baltimore & Ohio in a circular recently issued to trainmen. They are urged to get aboard promptly and before starting, in order to minimize the danger of bodily injury as well as to facilitate operation. It is held that boarding trains promptly makes it possible to attain the maximum speed more quickly, while it also obviates the necessity of the engineman dividing his attention.

Under the direction of Surveyor General Frank S. Ingalls twelve more engineering parties have been placed in the field to survey the land grants which are owned by the Atchison, Topeka & Santa Fe in Arizona. These grants aggregate more than three million acres of land in Mojave, Yavapai, Coconino, Navajo and Apache counties. The survey work was started early in January, when twelve engineering parties took the field. This latest addition makes a total of 24 parties that are engaged in the work. It is expected that the surveys will be finished about June 15. The cost will be about $200,000, one-half of which will be borne by the railroad and the other by the government.

The air-brake tests made by the Pennsylvania on the West Jersey & Seashore last year have been made the subject of a pamphlet issued by the road, written in popular style and designed to give the laymen a general idea of the tests and their results. The pamphlet says that the electrically controlled air-brake, which applies on the whole of a long train within two seconds, has been adopted by the Pennsylvania as standard for passenger trains, and the company will equip all new passenger cars with it. Cars now in service will be equipped as rapidly as opportunity and available funds will permit. Most of the tests were made with a train of twelve steel passenger cars; and this train, going at sixty miles an hour, on level track, was stopped within its own length, or in about two-thirds the distance required by ordinary brake control. A single passenger car, without the engine, running at that speed, on level track, was stopped in 725 ft. The twelve car train, with its locomotive, running at eighty miles an hour, was stopped in 2,197 ft. The tests occupied the entire time of 45 men for three months and cost over $50,000. In the electrically controlled brake the emergency and the regular brake features are entirely separated one from the other, so that an emergency applicaton can be made, with full force, at any time.

The Pennsylvania Railroad in the 12 months of 1914 reported as killed 19 people, which are classed in the Interstate Commerce Commission's accident records as passengers, but which the company is anxious to have classified, as they justly should be, as persons who in most or all the cases were killed by their own negligence or want of caution. Six people were killed in falling, jumping or slipping from moving cars or trains; two, in attempting to get on moving trains; two, slipping off station platform in front of trains; two, standing too close to edge of station platform and being struck by trains; one, jumping off ferry boat; one throwing himself between cars of moving train; three, crossing tracks at stations in front of trains; one, struck by coach and thrown under train; one, assaulted by another passenger and thrown from train. Among the 301 trespassers killed on the Pennsylvania in 1914, there were persons from all walks of life; students, lawyers, painters, salesmen, miners, soldiers, stationary engineers, and others. The fruits of the Pennsylvania's aggressive campaign against trespassing during the past eight years are indicated in part by the following:

Year	Number killed	Year	Number killed
1907	572	1911	338
1908	475	1912	255
1909	410	1913	311
1910	336	1914	301

The railroad management proposes to redouble its efforts this year to reduce the practice of trespassing, and to this end it will seek the co-operation of all county, city and borough authorities.

Incendiary Fire

Forty-five freight cars of the Mobile & Ohio at Whistler, Ala., and at Prichard, a suburb of Mobile, were destroyed by fire on the morning of February 17. The fire was apparently of incendiary origin, as every car was found uncoupled so that the switch engines could not move them. While the fire at Whistler was at its height, the one at Prichard broke out. During the fire at the first named place, the hose that the railroad fire department was using was cut in two.

New Haven Officers' Western Observation Trip

A party of officers of the New York, New Haven & Hartford has recently returned from a trip of 3,950 miles over 15 western railroads, made at the direction of President Elliott, for the purpose of seeing what could be learned from the operation of other roads that would be helpful to the New Haven. The party consisted of J. M. Tomlinson, vice-president; David Van Alstyne, assistant to vice-president in charge of operation; C. L. Bardo, general manager; G. W. Wildin, mechanical superintendent; W. J. Backes, engineer, maintenance of way; R. D. Fitzmaurice, superintendent, Providence division; R. A. Weston, general storekeeper, and W. L. Spicer, special accountant.

This was the first trip of its kind ever made by officers of a New England railroad. Particular attention was paid to fuel accounting and fuel efficiency, and to the careful use of material. The trip consumed two weeks. Leaving New York via the Lehigh Valley, the party first went to Buffalo and thence by the Michigan Central to Detroit, where a day was spent in investigating the efficiency in the automobile industry. At Detroit the party also inspected the passenger station of the Michigan Central. In Chicago the party investigated some of the methods of the Illinois Central, the Chicago, Burlington & Quincy, the Atchison, Topeka & Santa Fe, the Chicago, Milwaukee & St. Paul, Chicago & North Western and Chicago, Rock Island & Pacific railroads; in St. Paul, the Northern Pacific and Great Northern were studied; in Omaha, the Union Pacific; in St. Louis, the Missouri Pacific, the Wabash and the St. Louis & San Francisco.

The plan followed was first to visit the accounting department and have explained the various reports and statistics sent out to the different operating officers, after which the various department heads visited the respective heads of similar departments of the roads visited to learn the manner in which these reports and statistics are applied to secure great efficiency. Shops, storehouses, fuel depots, stations and yards were inspected personally under the guidance of the officers of the roads. A short time was also spent at Kansas City, where the

new Union passenger station was inspected. Some of the members of the party also visited Springfield, Mo., where the shop methods and the scrap reclamation plant of the St. Louis & San Francisco were studied.

Proposed New Produce Terminals for Chicago

The Produce Terminal Corporation, a subsidiary of the Chicago Junction Railway, has prepared comprehensive plans for a large produce terminal to be located just west of the Union Stock Yards, Chicago, on the property of the Chicago Junction. The tentative plans provide for the handling of all incoming and outgoing fruit and produce, both L. C. L. shipments and carload lots. The main building is to be an eight-story storage plant centrally located, of which the first and second floors, respectively, will be devoted to the handling of outgoing and incoming L. C. L. freight, from which point it is to be distributed to the numerous rows of stores. This central building will have a capacity of 350 cars.

Team tracks are provided for freight in carload lots. These tracks will have a total combined capacity of approximately 500 cars, and are arranged in two separate locations. The proposed general produce freight yards will be located south of the team tracks and buildings and will have a capacity of 10,000 cars. A large dock house for handling water shipments is to be located at the east end of the yard and a central power station at the west end. The administration building is to be near Thirty-ninth street and facing Ashland avenue. According to plans the Chicago Junction, which connects directly with every trunk line entering Chicago, will serve the entire terminal. This arrangement, it is thought, will be much more convenient and economical than the present arrangement on South Water street, where the produce must all enter by two roads, and much of it must also be transported across the river. It is the present congestion on South Water street which has led the commission men to seek a new location.

It is planned that work on this project will be begun about March 15, 1915. The officers of the Produce Terminal Corporation are: President, J. A. Spoor, chairman of the board of the Union Stock Yard & Transit Company, and of the Chicago Junction Railway; vice-president, Arthur G. Leonard, president of the Union Stock Yard & Transit Company; secretary, Anderson Pace, formerly industrial commissioner of the Chicago Association of Commerce; treasurer, Halsey E. Poronto, vice-president, of the Union Stock Yard & Transit Company, and the Chicago Junction Railway. It is estimated that the total ultimate cost of the entire terminal, including land and buildings, will approximate $20,000,000.

The Atchison, Topeka & Santa Fe is also considering plans for a similar terminal to be located between Fourteenth and Twenty-second streets, and west of State street.

Proposed Railway Legislation

Committees of the Utah legislature have held several hearings on a proposed bill to create a public utilities commission for the state.

A bill has been introduced in the legislature of Missouri repealing the present law prescribing a passenger fare of two cents a mile and fixing the maximum at 2½ cents a mile.

A bill has been introduced in the Washington legislature, as a substitute for the train-crew law, to give the state public service commission power to regulate the number of train employees.

Senator Harris of the Illinois legislature has announced that he will introduce a bill providing for a referendum vote on the question of increasing the state passenger fare from 2 to 2½ cents a mile.

The lower House of Congress on Monday of this week refused to take up the bill to require separate accommodations for negroes on cars in the District of Columbia; and this action is understood to have killed the bill for the present session.

The Senate committee of the West Virginia legislature has made unfavorable reports both on the full-crew bill and the railway "experience" bill; but the bill to require high-power headlights was returned to the Senate with a report approving it.

A bill has been introduced in Congress this week to compel railroads to base interstate passenger fares on the rates charged for intrastate passengers; requiring them to make interstate rates not exceeding the combination of intrastate rates over the same route.

A bill before the legislature of Alabama proposes to reduce the rates charged by the railroads for excess baggage, the present rate of one-sixth the passenger fare being reduced to one-eighth the fare. There is a clause also requiring baggage to be stored free, at destination, for 48 hours.

The Michigan legislature has adopted resolutions calling on the state railroad commission to express to the legislature its views in the matter of proposed increases in passenger fares, and to inform the legislature as to the correctness of certain statistics placed before it by the railroads.

The bill before the legislature of South Carolina designed to limit the length of freight trains to fifty cars, which was noticed in the *Railway Age Gazette*, February 12 page 268, was killed in the Senate last week, following a discussion lasting several hours, by a vote of 24 to 15. The Merchants' Exchange of Charleston had presented a strong protest against the bill.

In West Virginia a newspaper published in the interest of colored citizens in the Norfolk & Western coal field, has protested against two bills now before the legislature, a "full-crew" bill, and a so-called "experience" bill; claiming that the enactment of such laws will lead to the displacement of porters on trains and be followed by reductions of wages of negro employees.

Operating officers of the railroads in Indiana appeared before a committee of the Indiana legislature last week at a hearing on the bill to prohibit the running of freight trains more than half a mile in length. They stated that if the bill became a law the railroad companies would be forced to spend millions of dollars in Indiana to provide for new locomotives and additional facilities.

The lower House of the Kansas legislature has passed a bill to authorize the Colorado, Kansas & Oklahoma Railroad, a 50-mile line running between Scott City and Winona, Kan., to charge passengers five cents a mile. The bill aroused a lively controversy in the House; but western Kansas representatives asserted that the railroad would have to go out of business if not allowed an increase in rates.

A bill in the Texas legislature, introduced by Senator Dawin, provides for placing all interurban railways under the regulative authority of the State Railroad Commission. Substantially all companies of this character in the state have appeared before the Senate committee and offered strong opposition to the proposed law, and the committee made an adverse report. There is, however, a minority who will bring the measure before the full Senate.

The legislature of North Carolina has before it a bill to require all railroad employees to pass an examination on signals, and other matters connected with their duties, a catechism of 223 questions. Hearings have been held by a joint committee of the Senate and the House. It is said that the purpose of the bill is to make it possible to tie the hands of the railroad companies in case of a strike of trainmen. Not only the railroad companies but some railroad employees have appeared in opposition to the bill.

The first railroad bill to be put to a vote in the house of the Missouri legislature is a bill to require railroads to construct car sheds at their various terminals. This bill escaped defeat on February 20, it is reported, only by a vote to lay the bill on the informal calendar. Immediately afterward the house refused to take up a headlight bill as a special order.

The Oregon legislature has under consideration a bill to change the manner of electing members of the State Railroad Commission. The members are now chosen from the state at large, but by the proposed law would be selected from different congressional districts. The bill has already passed the lower House. The present commission has the reputation of having been free from sectional prejudices or leanings, and its rulings have never been disapproved by the courts. Candidates from the eastern part of the state—the part which appears to feel that it has been neglected—are already appearing.

Three bills presented in the legislature of Connecticut call for a reduction in the price of mileage tickets from 2¼ cents a mile

to 2 cents; a reduction in the rates for all single tickets to two cents a mile and the reduction of all rates to 1½ cents a mile for passengers who have no baggage. The recent advance in rates for both tickets and mileage books made necessary, as everybody knows, by the increase in the cost of transportation, appears to have had no effect toward dampening the ardor of the legislator who introduced these bills; and the railroad company had to go through the usual process of appearing before the legislative committee and presenting the reasons why the proposed laws should not be enacted.

The Morris canal, extending from Jersey City, N. J., to Phillipsburg, 102 miles, and controlled by the Lehigh Valley Railroad, is the subject of a special message which has been sent to the legislature by the governor of New Jersey. This canal is no longer profitable and the railroad company for several years has been negotiating with the state, looking to the adoption of a plan for its abandonment. The governor suggests that the property be turned over to a state department and that the state develop it. The water rights should be retained by the state and all other property sold or leased. The income should be paid to the Lehigh Valley until 1974, after which date the property would belong absolutely to the state. The governor disapproves all of the bills on this subject which have been presented in the legislature. He would require the railroad company to pay the state $500,000 a year for being relieved of the maintenance of the canal.

TEXAS

That the days of railroad "baiting" in Texas are not ended is shown by the unusually large number of bills affecting the railroad interests of the state which are now before the legislature. Most of the pending bills have originated with the labor organizations and have strong political support.

One bill provides that all employees shall be paid semi-monthly and there are prospects that it will be passed, as it has been favorably recommended by committees in both the Senate and House. This measure if it becomes a law will add about $250,000 annually to the expenses of the railroads.

Another bill which would impose enormous expenditures if it should be passed is that which provides that an enclosed workbuilding shall be erected at all stations where four or more men are employed.

A bill before the Senate provides that employees shall have the privilege of selecting their own bondsmen instead of being bonded by the surety companies. Under the present method the employees pay nothing for making their bonds, this expense being borne by the railroads. The measure is being fought by the railroads because it would tend to confusion.

The bill which was introduced in the House providing for a reduction of the passenger rate from three cents to two cents a mile seems to be meeting with little favor and its passage is considered to be unlikely. It is opposed by the railroads, and also by their employees.

The House has acted favorably on a bill which provides that all railroad hospitals in the state shall be placed under the joint management of the railroads and their employees. At present the railroads have full control of these institutions. The railroads oppose the measure because they claim the efficiency of the hospitals will be lowered if any change is made, and also that the bill would give the right to so-called "damage suit" lawyers to enter the hospitals and solicit suits from injured employees.

The passenger departments of the railroads are fighting the bill which is pending in the House that provides for the redemption by railroads of unused tickets at the destination point. This and other provisions of the bill are said to practically legalize ticket scalping.

The "full-crew" bill which was reported adversely by the House and Senate committees will be taken up on the floor by means of a favorable minority report. It is thought that it has little show of being passed.

Senator Hall has introduced a bill requiring all handcars to be equipped with gasolene or electric motors. The House has passed a bill placing all spur tracks (private sidings) under the jurisdiction of the railroad commission.

Senator Cowell proposes to prohibit a railroad from removing its general offices or shops from one point to another without first obtaining permission of the railroad commission. A bill prohibiting the blocking of crossings by railroad trains in cities and towns has been introduced in the House. A bill by Representative Lewelling, makes it unlawful for a railroad to discharge or coerce an employee belonging or seeking to belong to any labor organization. An anti-blacklisting bill has been introduced in the Senate by Mr. Lattimore and is being opposed by the railroads.

The Senate has before it a bill which gives the railroad commission authority to require railroads to make repairs to their tracks and other property as in the judgment of the commission may be deemed necessary. Another bill requires section foremen to make sworn statements of all domestic animals killed or injured by trains.

Mr. Nichols has introduced a bill to punish the railroads for permitting Bermuda grass to grow on their land and allowing it to spread to other property. Senator McNealus is author of a bill which requires engineers and others operating steam engines and boilers to procure a license. Mr. McFarland has introduced a bill in the House making it a felony for a railroad employee to make false or fraudulent entries of the cost of car repairs and other transactions. A bill is pending in the Senate which makes it unlawful for steam to escape from a locomotive to an extent that would obscure the vision of employees working about it. Senator Townsend is author of a bill which seeks to regulate the salaries of railroad presidents and other higher officers.

The Senate committee has reported favorably the Westbrook bill, which requires all railroads to give certain classes of their employees four days' rest each month. These classes include station agents, tower men and clerks; and all telegraphers who do not now come under the provisions of the eight-hour law. It affects approximately 24,000 persons.

Railway Telegraph Superintendents

The regular meeting of the western division of the Association of Railway Telegraph Superintendents will be held in the La Salle hotel, Chicago, Ill., on March 17 and 18. The business sessions will be arranged to allow the members plenty of time during the afternoons to visit the annual exhibition of the National Railway Appliance Association, which is to be held in the Coliseum, in Chicago, March 15-19. The following papers will be read before the meeting: "Pole and Wire Maintenance," by E. H. Ward of the Western Union Telegraph Company; "Modern Testing Facilities and Their Relation to Railway Wire Plant Efficiency," by W. Rogers, telegraph engineer of the Missouri Pacific, and "Shall Inside Maintenance be Handled by Linemen or Special Equipment Men?" by L. M. Jones, superintendent of telegraph of the Atchison, Topeka & Santa Fe.

Air Brake Association

The twenty-second annual convention of the Air Brake Association will be held at the Hotel Sherman, Chicago, Ill., Tuesday, May 4, 1915. Committees will report on the Accumulation of Moisture and its Elimination from Trains and Yard Testing Plants, Adequate Hand Brakes on Heavy Passenger Equipment Cars, Need of Efficient Cleaning and Repairing of Freight Brakes, What Shall We Do to Improve the Present Pneumatic Signal Device, Difficulties the Railroad Companies Encounter in Endeavoring to Run 100 Per Cent Operative Brakes in Freight Service, and M. C. B. Air Brake Hose Specifications.

National Railway Appliances Association

It is announced that 138 railway supply firms have taken space in the Coliseum for the exhibit of the National Railway Appliances Association, to be held in Chicago, March 15 to 19, in connection with the meeting of the Railway Signal Association and the Convention of the American Railway Engineering Association. This number compares very favorably with that of last year and indicates that the exhibit will be most successful.

Railway Club of Pittsburgh

At the regular monthly meeting of the Railway Club of Pittsburgh, to be held at the Monongahela House, on Friday, February 26, a paper will be presented by Prof. Louis E. Endsley of the University of Pittsburgh, entitled "Some Experiments to Determine Forces on a Truck Side Frame, and Stresses Produced by These Forces."

American Society for Testing Materials

The eighteenth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., June 22, 23, 24, 25 and 26.

MEETINGS AND CONVENTIONS

The following list gives the names of secretaries, dates of next or regular meetings, and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Demurrage Commissioner, 845 Old South Bldg., Boston, Mass. Annual convention, March 23, 1915, Jefferson Hotel, Richmond, Va.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, April 15-16, San Francisco, Cal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 16-18, 1915, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. W. Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except June, July and August, 220 W. 57th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, 1300 Pennsylvania Ave., N. W., Washington, D. C. Annual convention, April 28, 1915, Piedmont Hotel, Atlanta, Ga.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawler Ave., Chicago. Regular meetings, 2d Monday in month, except July and August, Lytton Bldg., Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Next convention, March 15-19, 1915, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings monthly.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill. Regular meetings, 2d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Friday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Times Bldg., Bethlehem, Pa. Next meeting, March 15, 1915, Chicago. Annual meeting, September 21-24, 1915, Salt Lake City, Utah.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, Hotel Utah Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Candler Bldg., Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—John J. Kautzmann, P. O. Box 238, Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings last Tuesday in month, except June, July and August, Waldorf-Astoria, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie R. R., Pittsburgh, Pa. Meetings bimonthly, Pittsburgh. Annual meeting, 2d Monday in June.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, L. S. & M. S., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Karpen Bldg., Chicago.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings.

REVENUES AND EXPENSES OF RAILWAYS

SIX MONTHS OF FISCAL YEAR ENDING JUNE 30, 1915—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—Freight.	Operating revenues—Passenger.	Operating revenues—Total. inc. misc.	Operating expenses—Maintenance—Way and structures.	Operating expenses—Maintenance—Of equipment.	Operating expenses—Traffic.	Operating expenses—Transportation.	Operating expenses—Miscellaneous.	Operating expenses—General.	Operating expenses—Total.	Net operating revenue (or deficit).	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Oahu Ry. & Land Co.	109	$476,871	$137,005	$652,998	$65,574	$54,458	$3,894	$130,041	.....	$27,103	$281,071	$371,926	$43,217	$328,709	$13,115
Panhandle & Santa Fe.	668	1,574,464	348,001	2,018,583	358,248	386,065	22,489	630,956	.....	51,866	1,449,624	568,959	52,795	515,805	311,523
Pere Marquette	2,319	6,332,065	2,242,496	9,350,708	850,317	1,786,798	192,828	3,519,144	$30,465	270,951	6,647,615	2,703,093	318,025	2,384,308	1,500,086
Philadelphia & Reading	1,120	19,154,024	3,499,306	23,783,287	2,315,033	4,327,480	267,952	8,400,360	76,271	413,421	15,798,368	7,984,919	601,218	7,380,673	—1,211,916
Pittsburgh & Lake Erie	224	6,396,763	887,466	7,601,788	1,047,684	1,659,888	89,022	2,042,580	20,667	165,903	5,025,745	2,576,044	310,596	2,265,323	—1,414,761
Pittsburgh, Shawmut & Northern	294	882,366	67,814	963,030	208,792	264,777	9,195	313,157	.....	24,751	820,673	142,356	9,813	132,544	20,893
Port Reading	21	622,002	.....	754,271	94,996	52,562	233	247,162	.....	2,203	397,154	357,117	22,000	285,117	—15,825
Rutland	468	1,000,185	618,917	1,846,045	230,529	308,920	49,277	712,930	7,523	35,786	1,345,016	501,029	102,851	398,178	—90,604
St. Louis, Iron Mountain & Southern	3,365	11,755,712	2,856,920	15,809,345	2,280,930	2,782,209	340,865	4,980,618	52,282	364,405	10,801,309	5,008,036	678,192	4,323,867	—1,304,355
St. Louis Merchants' Bridge Terminal	9	.....	1,117	934,534	126,138	39,209	4,602	468,642	.....	40,630	679,222	255,313	43,949	211,359	96,523
St. Louis, San Francisco & Texas	235	452,197	172,883	665,894	155,489	103,748	13,835	288,715	.....	28,326	590,112	75,782	7,649	68,112	—152,498
St. Louis Southwestern	943	2,804,656	659,790	3,678,256	464,418	638,414	155,436	1,019,230	20,387	158,873	2,455,541	1,222,714	185,764	1,036,580	—573,204
St. Louis Southwestern of Texas	811	1,271,137	528,756	1,955,360	465,378	497,830	73,589	903,505	5,570	106,279	2,029,396	—74,036	87,098	—161,773	—246,867
San Antonio & Aransas Pass	724	1,421,284	609,534	2,164,862	387,430	393,926	40,088	1,001,461	.....	68,994	1,891,898	272,964	72,002	200,754	—422,070
San Pedro, Los Angeles & Salt Lake	1,132	2,977,164	1,268,921	4,673,088	504,141	733,798	192,679	1,520,894	79,349	108,723	3,139,584	1,533,504	246,356	1,286,646	—154,225
Southern	7,036	20,813,067	9,057,231	32,765,576	4,462,787	5,830,087	1,135,812	11,934,030	208,795	1,034,800	24,538,336	8,227,240	1,275,094	6,943,781	—3,165,225
Southern in Mississippi	281	335,343	183,731	567,696	133,745	54,637	14,250	249,186	.....	22,248	474,066	93,630	50,907	42,645	—63,501
Spokane International	163	304,392	96,497	421,892	72,836	29,596	13,494	133,543	.....	21,481	270,950	150,942	28,476	122,427	—110,474
Tennessee Central	294	507,080	210,677	766,732	179,684	104,249	33,349	300,936	.....	40,546	658,673	108,060	26,846	81,113	—130,889
Terminal R. R. Ass'n of St. Louis	35	.....	1,093	1,384,881	117,387	69,395	5,434	477,036	.....	31,789	701,043	683,838	171,141	512,697	191,021
Texas & New Orleans	469	1,261,728	563,405	2,022,124	343,201	482,605	46,718	836,098	66,467	63,540	1,837,877	184,247	95,714	87,175	—116,685
Texas & Pacific	1,887	6,495,338	2,307,293	9,534,563	971,893	1,480,763	224,336	3,877,763	89,971	233,295	6,873,033	2,661,530	421,336	2,238,085	—271,674
Toledo & Ohio Central	446	2,363,692	334,252	2,874,676	406,221	492,603	48,740	1,026,575	10,633	59,544	2,044,316	830,360	137,205	691,403	130,211
Toledo, Peoria & Western	248	353,187	240,872	633,716	97,329	162,003	15,061	268,526	.....	21,505	564,426	69,290	36,600	32,690	21,388
Toledo, St. Louis & Western	451	1,947,371	182,040	2,291,970	292,433	360,590	97,734	882,052	.....	52,215	1,685,023	606,947	155,388	451,559	—292,940
Trinity & Brazos Valley	315	424,594	119,118	587,116	119,085	62,669	19,706	279,096	.....	49,142	529,698	57,418	25,530	31,721	—8,258
Ulster & Delaware	129	287,602	222,387	598,499	92,712	93,105	9,651	266,461	330	24,112	486,371	112,128	19,800	91,547	—53,325
Vicksburg, Shreveport & Pacific	171	409,095	258,396	746,213	127,357	166,888	21,279	283,066	14,643	30,218	643,451	102,762	43,007	59,754	—140,876
Virginia & Southwestern	240	856,654	90,029	875,296	144,134	223,101	14,965	281,969	.....	23,646	687,815	287,480	38,333	249,148	—28,326
Wabash	2,519	10,478,498	3,449,960	15,273,342	1,772,001	2,710,118	511,243	6,002,223	91,825	370,551	11,440,920	3,832,422	487,862	3,343,320	—190,669
Western Pacific	943	2,274,652	631,863	3,087,222	690,961	389,135	154,913	997,958	69,496	128,099	2,430,562	656,661	173,981	481,619	—220,793
Spokane, Portland & Seattle	556	1,491,969	813,863	2,532,210	286,137	213,818	47,208	550,760	21,251	80,645	1,199,747	1,332,464	320,400	1,011,716	—36,937

Traffic News

Tolls received by the government for the passage of vessels through the Panama canal for the six months ended February 12, amounted to over $2,000,000.

The railroads west of Chicago have filed tariffs with the Interstate Commerce Commission providing for the issuance of 2,000-mile mileage books, good only for interstate travel, at the rate of 2¼ cents a mile, effective on March 1.

The Chicago & Eastern Illinois has again been awarded the contract for carrying the United States mail between Chicago and St. Louis. To retain the mail the road has promised to reduce the time of its fast mail train from 7 to 6½ hours.

On April 12 a new passenger train from St. Louis to San Francisco will be put on by the Missouri Pacific, the Denver & Rio Grande and the Western Pacific. The train will leave St. Louis at 2 p. m., and arrive at San Francisco at 5:45 p. m., the third day.

Resolutions favorable to the request of the railroads for an increase in the state passenger fare from 2 to 2½ cents a mile have been adopted by 62 commercial and civic associations in Indiana, which were visited by a committee of passenger officers of the roads in the state.

The New York City Association of Passenger and Ticket Agents held its annual dinner at the Hotel Astor, Saturday evening, February 20, about 400 persons being present. The speakers were D. M. Wootton, president of the association; J. F. Dillon, and Dr. Frank Crane.

Twenty-eight new stations with freight facilities have been established recently by the Baltimore & Ohio, according to a circular issued by the traffic department. The new stations are on the eastern lines of the system, embracing the Baltimore & Ohio, the Little Kanawha and the Valley Railroad of Virginia.

The quarantine at Pittsburgh against foot-and-mouth disease was lifted at the beginning of this week. New quarantines continue to be reported from various localities, Erie county, N. Y., being one of the latest. The state of Vermont has prohibited the transportation of live stock into that state from Massachusetts.

The Chicago & North Western, the Chicago, Milwaukee & St. Paul and the Minneapolis, St. Paul & Sault Ste. Marie have filed a petition with the Wisconsin legislature submitting a bill to increase passenger fares in the state from 2 to 2½ cents a mile, and asking the legislature to make a full and complete investigation into the existing rates.

The Atchison, Topeka & Santa Fe on Monday, March 1, the date on which the reduced fares to San Francisco, on account of the Panama-Pacific Exposition go into effect, will run its California Limited train in eight sections; on Tuesday the train will be run in five sections, on Wednesday in three sections, on Thursday in three sections, with an additional Raymond & Whitcomb special train; on Friday in two sections, and on Saturday in three sections. These trains will each be made up of four to six sleepers, one combination car and one observation car.

The Canadian Freight Association, acting on behalf of all of the Canadian railways, has filed with the Board of Railway Commissioners for Canada application for permission to make a general increase of freight rates. It is proposed to advance the first class rates by two cents per hundred pounds, and fifth class rates one cent, in addition to a number of increases in commodity rates, including an advance of 10 cents a ton on coal and coke, 5 cents a ton on sand, gravel and crushed stone, and 5 to 30 cents a ton on pig iron, wire rods, rails and iron ore concentrates; also increases of varying amounts on cord wood, paving blocks, stone, iron and steel, lumber and forest products, petroleum and grain products. An increase of from 1 to 2 cents per 100 lb. on livestock is also proposed.

With the addition of a new passenger train on February 7, the Atchison, Topeka & Santa Fe now has five trains daily from Chicago to California. The new train, called the "Missionary," leaves Chicago at 10:30 p. m., reaches Kansas City at 10:45 a. m., and Los Angeles at 7:50 p. m., the third day. This train will be but 50 minutes slower than the "California Limited," and it runs via Newton, Amarillo and Belen. Through standard sleeping cars have also been put on between New Orleans and San Francisco on a new train known as the "California Special," leaving New Orleans in the evening and arriving at Los Angeles at 7:50 p. m. on the third day. Travel over the Sante Fe to California recently has been very heavy. The "Santa Fe De Luxe," the extra-fare train to southern California, has been running to full capacity, and the "California Limited" has been run in as many as six sections.

In response to a resolution adopted by the Missouri legislature the Missouri Public Service Commission, which was called upon to furnish information as to whether the present freight and passenger rates in the state are, in its opinion, sufficient to yield a reasonable compensation for the service rendered, has filed with the Senate a report of the progress made in the hearings which the commission has already held on the application for increases filed by the railroads. The commission says in its report that while the testimony and exhibits thus far offered in evidence by the carriers make a prima facia showing that the new rates are insufficient to yield a reasonable compensation for the service rendered, the commission does not feel justified in attempting to pre-judge what will be the effect of the testimony hereafter to be offered by the interveners in the cases, and what will be its final conclusions on the whole testimony introduced.

Iowa Campaign for Increased Passenger Fares

As briefly noted in last week's issue, a committee of executive officers of the Iowa railroads held a conference at Des Moines, on February 16, with Governor Clarke, the lieutenant-governor, the speaker of the House and members of the state railroad commission, to ask the state officers to support the petition of the railroads for an increase in passenger fares in the state from 2 to 2½ cents a mile. President S. M. Felton, of the Chicago Great Western, made an address on behalf of the railroad men, in which he said that there are only 13 states in the union that have in effect the maximum rate of 2 cents a mile for passenger service, and that the population per mile of railroad, in those 13 states, averages 472, while in eight eastern states, with an average maximum fare of 2½ cents a mile, the population per mile of railroad is 1,036; and that in 27 other states, with rates ranging from 2½ cents to 6 cents a mile, the average population per mile is 280, while the population per mile of railroad in Iowa is 224, which is less than the average of the 13 two-cent states.

Mr. Felton showed that under the two-cent fare law the gross earnings of the railroads in the state had increased 22.2 per cent, while expenses had increased 31 per cent, and the increase in miles of railroad built has been only 1.5 per cent; while the increase in the corresponding period of years before the passage of the two-cent fare law had been 10.9 per cent.

Governor Clarke made a brief reply saying that he was sure the people of Iowa wished to be perfectly fair and just with the railroads, and that he felt confident that they would not be willing that the railroads should render their great service to the country without a compensation that would return a just and reasonable profit. "The people have always shown a willingness to do exactly the right thing," he said, "and all they ask is a fair, open and frank statement of all the facts and when they are sure that they have them and they are understood I feel certain that the right and honest thing will be done." At the conclusion of this conference the railroad men appeared before a joint session of the senate and house committees on railroads of the Iowa legislature, and made a similar presentation of their case.

NEW MANCHURIAN RAILWAY.—An agreement has been made by the Bensichu Coal Mines Company and the Southern Manchurian Railway for the construction of a railway from the mines to Tzentchan. The authorization of the Chinese government has already been obtained. At present there is only a 9-mile narrow-gage line at Bensichu, simply for the use of the mines: it ends at Nyusindaya, where there are also coal mines. The new line will serve a rich mining district throughout its whole length. It will be about 50 miles long. If it is found that the narrow-gage line referred to is worth it, it will be widened to normal gage.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Texas Railroad Commission has filed a formal complaint with the Interstate Commerce Commission, charging that Galveston is being discriminated against as compared with New Orleans, because of the demurrage charges and regulations applying at Galveston.

Hearings were begun on February 16 before Commissioner Meyer on the petition under the Panama Canal Act of the Central of Georgia and the Atlantic Coast Line to continue control of the Ocean Steamship Company and the Peninsula & Occidental Steamship Company, respectively.

The Chambers of Commerce of Cleveland, Toledo, Springfield, Canton, Columbus and Dayton, Ohio, and Detroit, Mich., have filed a joint complaint with the Interstate Commerce Commission, alleging discrimination in the rates from those cities to the southeastern Mississippi valley in comparison with the rates from Chicago, Milwaukee, Peoria and Davenport to the same territory.

Clifford Thorne, chairman of the Iowa Railroad Commission, has filed a protest with the Interstate Commerce Commission on behalf of nine western states, including Iowa, Nebraska, North Dakota, South Dakota, Colorado, Oklahoma, Arizona, Minnesota and Arkansas, asking the commission to suspend, pending investigation, the tariffs filed by the railroads increasing interstate passenger fares in the west from 2 to 2½ cents a mile, to take effect on March 1.

Rates on Wool to Provo, Utah

Knight Woolen Mills v. Chicago & North Western et al. Opinion by Commissioner Hall:

The commission finds that the rates on scoured wool, compressed in bales, from Chicago to Provo, Utah, and other Utah common points should not exceed $2.25 per 100 lb. in carloads, minimum weight 13,500 lb., subject to rule 6-B of the western classification; and $3 per 100 lb. in less than carloads. Reparation awarded. (32 I. C. C., 490.)

Rates on Packing House Products to Points in Utah

Cudahy Packing Company v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Meyer:

The commission finds that the commodity rates on packing house products shipped in mixed carloads with fresh meat from Wichita and Kansas City, Kan.; South Omaha, Neb., and South St. Joseph, Mo., to Utah common points are unreasonable to the extent that they exceed the fifth-class rate. The case is held open for the determination of the amount of reparation. (32 I. C. C., 560.)

Rates on Clay from Points in Georgia to Eastern Points

Opinion by Commissioner Clements:

The commission finds that the carriers have not justified proposed increased rates on clay, crude or ground, in bags, barrels or casks, carload minimum weight 50,000 lb., from producing sections in Georgia and South Carolina to New York, Boston and interior eastern points via rail-and-water routes through Savannah, Ga., and Charleston, S. C. The increased rates were uniformly 28 cents per gross ton higher than the rates which are to remain in effect. (32 I. C. C., 564.)

Rates on Cotton Linters

Salt Lake Mattress & Manufacturing Company et al. v. Atchison, Topeka & Santa Fe, et al. Opinion by Commissioner Meyer:

The commission finds that the present rates on cotton linters from producing points in Texas, Oklahoma, Louisiana and Arkansas, and from Memphis, Tenn., to Salt Lake City and Ogden, Utah, and points taking the same rates are discriminatory against Salt Lake City and Ogden as compared to Denver, Colo., and points taking the same rates and to the California and the North Pacific coast terminals. It is held that the rates to Salt Lake City should not exceed the rates to Denver from points of origin in Texas by more than 49 cents per 100 lb., one cent more than the maximum differential between the fifth-class rates to Denver and Salt Lake City respectively from Chicago. (32 I. C. C., 417.)

Rates On Live Stock In Double Deck Cars

American Live Stock Association et al. v. Southern Pacific. Opinion by Commissioner Daniels:

Upon a supplemental hearing the commission affirms its decision in 26 I. C. C., 37, that rates on sheep or goats in double-deck cars from points in Arizona to points in California should be the same as the rates on fat cattle. The original decision prescribed a schedule of maximum distance rates for the transportation of live stock from points in Arizona to Los Angeles and other points in California, and is now supplemented by the addition of a schedule of maximum additional charges for branch line hauls and for hauls over two or more lines. The defendants are also required to provide in their tariffs that when a double-deck car is ordered, and two single-deck cars are furnished instead, the charges shall be at the rate for a double-deck car of the size ordered, provided the shipment could have been loaded in a double-deck car. (32 I. C. C., 515.)

Rates on Cement and Other Commodities from St. Paul and Other Points to Montana

In re rates on cement, lime, salt and other commodities from St. Paul, Duluth and other points to stations in Montana. Opinion by Commissioner McChord:

The commission finds that the Northern Pacific and the Chicago, Milwaukee & St. Paul are justified in cancelling a commodity rate of 35 cents per 100 lb. on mixed carloads of lime, cement, stucco, plaster, roofing pitch and salt from St. Paul, Minneapolis, Minnesota Transfer, Duluth and West Duluth, Minn., and Superior, Wis., to a group of Northern Pacific stations in Montana commencing at the North Dakota-Montana line and extending to Custer, Mont., and to a group of stations on the Chicago, Milwaukee & St. Paul from Buffalo Springs, N. D., to and including Musselshell, Mont. It is found that small shipments of some of these commodities are included in the car in order to get the carload rate; and no satisfactory reason is given for the continuance of a rate which is applicable alone from St. Paul and points at the head of the lakes to selected groups of stations. (32 I. C. C., 532.)

Kansas City Stock Yards Tariff Rejected

Atchison, Topeka & Santa Fe et al. v. Kansas City Stock Yards Company. Opinion by Commissioner Meyer:

The defendant, doing a general stock yard business in Kansas City, filed a tariff effective April 8, 1914, imposing a trackage charge of 75 cents per car for the use of the stub tracks leading to some of the unloading docks in its yards by complainants and a switching charge of $2 per car for the movement of complainants' cars over these tracks by defendant. Prior to the effective date of this tariff defendant's charge was 50 cents for loading or unloading over its docks. The defendant, however, performed no switching and accorded the use of its stub tracks to the trunk lines gratuitously. The trunk lines absorbed the loading and unloading charge. Since April 8, 1914, defendant has exacted the trackage charge of 75 cents.

The commission finds that this proposed tariff should be struck from its files.

It is held that the movement over defendant's rails leading to its docks is a transportation service and that compensation by complainants to defendant for the use of its tracks and yards or for switching complainants' cars is not unlawful. It is held, on the other hand, that the defendant is not a common carrier and is therefore not entitled to exact compensation through a published tariff.

The Kansas City Stock Yards are not a plant facility, since they transport for shippers and for all shippers offering stock or directing its delivery at that point. The finding is made, however, on the ground that there is not a bona fide holding out coupled with the ability to carry for hire. The defendant at the present time owns no cars or locomotives, and it proposes to use locomotives obtained by an arrangement with the Chicago, Rock Island & Pacific. It did not expect the complainants to avail

themselves of the service offered, but expected that the complainants would continue to handle their cars to and from defendant's yards for themselves with their own motive power. It appears that defendant's real purpose is to secure compensation for the use of its tracks by complainants, and that the defendant holds itself out to transport complainants' cars solely in order to impose a trackage charge through a published tariff. The commission does not attempt to decide whether complainants may avoid defendant's trackage and switching charges by refusing to accept or deliver livestock at defendant's yards or whether they may add defendant's charges to their present live stock rates to and from Kansas City. (33 I. C. C., 92.)

Southwestern Yellow Pine Blanket Rates Upheld

Wisconsin & Arkansas Lumber Company et al. v. St. Louis, Iron Mountain & Southern et al. Opinion by Commissioner Daniels:

The southwestern yellow pine area is bounded on the north by the Arkansas river, on the east by the Mississippi, on the south by the Gulf of Mexico and on the west by a line through Kansas City and Houston. This area, approximately 400 miles long and 300 miles wide, is practically coterminous with the district in which, west of the Mississippi, the yellow pine, both long leaf and short leaf, originates. The rates on yellow pine from this area are blanketed, the rates to the gateways being as follows: to Thebes and Cairo, 16 cents; to Memphis, 14 cents; to St. Louis, 19 cents, and to Kansas City, 24 cents. These are proportional rates, although in some instances they are also quoted as local rates. The complainants seek a reduction of four cents in the rates to all gateways except Kansas City, and a reduction of six cents in the rate to that point. They also desire that the blanket area be divided along the thirty-third parallel, the common boundary of Louisiana and Arkansas, so that there will thereby be a differential advantage to the mills in the region north of that line over mills to the south.

The commission finds that the blanket rates should not be changed. There is perhaps greater warrant for the group or blanket system of rate making when applied to an area containing natural resources than in any other case. When materials are found only in delimited areas and consumed throughout widely extended markets, in which case there is no possibility of shifting the sources of supply, there is much to be said for blanket rates. Such an arrangement tempers to the common benefit of consumers generally the fortuitous advantage conferred by nature upon the localities in which such natural resources are found. The size of the present blanket may fairly raise a question as to the propriety of its permanent maintenance, but until it can be shown that the size of the area bearing common rates works injustice there is sufficient ground for maintaining it intact. It is true that Kensett, immediately north of the Arkansas river, enjoys a rate to Kansas City which contrasts sharply with the rate from Little Rock to the same point, but wherever a blanket boundary is drawn a disparity between the rates per mile and between the last station within the blanket and the first outside is sure to appear. The complainant at Little Rock should perhaps rather direct its attack against this discrimination. It is found that the average ton-mile earnings in this territory are reasonable as compared with similar rates on like traffic in other districts. It is believed also that the proposed remedy of dividing the blanket into two parts would be no fairer than the present arrangement, because by some of the lines the distances in some cases from points in the northern blanket would be greater than points in the southern blanket. The great number of east and west lines south of the proposed boundary makes it probable that were the rates reduced in the northern half of the blanket these lines would accord a similar abatement in rates and thus bring about a new equality in rates between both parts of the blanket.

A dissenting opinion by Commissioner Harlan draws attention to some of the injustices that result from a blanket rate, and especially one of such size as this. It is the commissioner's opinion that the rates would be more equitable if they were put upon a mileage basis. He also draws attention to certain exceptions in the blanket rates and to the fact that the southern mills in the district are accorded mileage rates to the gulf ports on export traffic. (33 I. C. C., 33.)

STATE COMMISSIONS

The Public Service Commission of Pennsylvania is preparing a study of all tunnels used by railroads in the state, and when the data are in hand some measures to regulate them may be prepared.

The New York State Public Service Commission, second district, has suspended until May 1, a tariff of the Long Island road increasing commutation rates filed to take effect March 1. A hearing will be held. The proposed increases were on 60-trip monthly and 46-trip monthly school rates.

The New York State Public Service Commission has ordered the Long Island road to have watchmen to attend the gates at three crossings in Freeport, N. Y., all night; the principal ground of the complaint, on which this order is based, being that the automatic bells, hitherto depended on for night warnings at these places, are kept ringing so much of the time that residents in the houses nearby are greatly annoyed.

PERSONNEL OF COMMISSIONS

The third member of the Railroad Commission of Arkansas is now Thomas E. Wood of Mariana, succeeding G. T. Breckenridge, whose term expired January 1. Mr. Breckenridge is now serving as temporary secretary of the commission, in place of Ernest Tipton, who has resigned to become assistant treasurer of the state. Mr. McKnight, heretofore chairman, is now the second member of the commission, the chairmanship having been taken by J. S. Roland. It appears that the Arkansas Commission, like the federal commission at Washington, changes its chairman every year.

COURT NEWS

The Supreme Court of the United States, in a decision handed down this week, has sustained an order of the Interstate Commerce Commission directing the Pennsylvania Railroad to make the same track connections at New Castle, Pa., with the Buffalo, Rochester & Pittsburgh that it makes with the Baltimore & Ohio.

The Supreme Court of the United States, deciding cases arising in Ohio and in Indiana, holds that employees of railroads working on trains engaged in interstate commerce who seek to recover for personal injuries must bring their actions under the Federal employers' liability act and safety appliance acts, and not under state statutes.

The Supreme Court of the United States, reversing the District Court for the Southern District of New York, decided in favor of the Erie Railroad in its contention for the right to issue passes to employees of steamship companies and other ocean carriers not subject to the Interstate Commerce Commission's jurisdiction.

The Supreme Court of the United States, in a decision handed down this week, holds that the Interstate Commerce law authorizes the Interstate Commerce Commission to award damages to shippers for illegal rates and discriminations, no matter at what date arising, provided claims were filed before August 28, 1907, which, the court held, was the date on which this provision of the law went into effect.

The Supreme Court of the United States has affirmed the judgment of the Circuit Court of Appeals for the Second Circuit that the Wells Fargo Express Company shall not be held liable for more than the stated nominal value of three automobiles ($50 each) in a bill of lading in the absence of a stipulated actual value and the payment of a higher rate. The three cars were destroyed in transit and the Pierce-Arrow Company sought to recover $15,000.

On November 7, 1914, indictments were returned by the federal grand jury at Chicago, against the Chicago Spring Butt Company, an Illinois corporation, on charges of violating the interstate commerce regulations relating to freight tariffs, by fraudulent billing of shipments. On Monday, February 15, 1915, W. J. Keene, president of the company, appeared before Judge Carpenter of the United States court and pleaded guilty of misdescription of shipments of spring hinges, which were described on his shipping instructions to the carrier as iron hinges. A fine of $500 and costs was imposed.

Implied Consent to Use of Yards by Another Railroad—Evidence as to Release

An engineman of the Birmingham Southern sought to recover damages from the Louisville & Nashville for personal injuries sustained by him as a result of the rear end of a train of the defendant being backed in the night time into an engine of the Birmingham Southern, of which he was the runner, while it was standing in defendants' yard. The yard was but a short distance from the junction point of the two roads. A principal contention of the defendant was that the plaintiff was a trespasser, and that the L. & N. employees in charge of the train were under no obligation to look out for a Birmingham Southern engine or train on that track other than the general duty to keep a lookout for obstacles on it. The track had been openly used by the Birmingham Southern for many years for the purpose of interchange of traffic between the two companies, with the acquiescence of the defendants' employees and those in charge of the yard. The court held that this imposed on the defendant, in respect of employees of the Birmingham Southern, a duty to exercise such reasonable precaution in the movement of its own trains on the track as ordinary prudence dictated, to protect from injury the Birmingham Southern men.

Evidence as to the duty of train men to have the rear end of the train lighted, and of the custom of well-regulated railroads to do this, was held to be admissible. Evidence as to a release executed by the engineman to his own company was inadmissible; but evidence as to the amount paid him by his own company on account of the injury was admissible, under the general rule that a partial satisfaction by another may be shown by the defendant in mitigation of damages. Judgment for the plaintiff was reversed, and a new trial ordered. L. & N. v. Burke, Alabama Court of Appeals, 66 So. 885.

Louisville & Nashville Wins in Suit Resisting Search for Papers

The Supreme Court of the United States in the suit of the government against the Louisville & Nashville Railroad, decided this week, says that the Interstate Commerce Commission has no authority under the interstate commerce act to require a common carrier to disclose private letter files and correspondence.

Acting under a special resolution of the Senate the commission made an investigation of the railroad company's affairs to determine the truth of a charge that it had been issuing passes in violation of law and doing other unlawful acts. When agents of the commission entered the offices of the railroad at Louisville to investigate they not only insisted that they should inspect the company's books and papers, but the letter press, books and correspondence file of the general counsel. He forcibly ejected the inspectors. The commission reported the case to the Senate as one of probable contempt. The attorney general was then directed to apply for a mandamus to compel the company to produce the letter files. The mandamus was refused by the district court and an appeal taken.

The opinion is by Justice Day. The court holds that sections 12 and 20 of the Interstate Commerce Act, authorizing the agents of the commission to require the production of "books and papers" do not empower them to compel the opening of letter files and private correspondence.

The decision does not go to the constitutional question of just how far the right of the commission to inspect might go in such matters; it merely rests on the wording of the statute, holding that under the sections named there is no power to compel the production of private letter files. The clause in question reads: "The commission shall at all times have access to all accounts, records and memoranda kept by the carriers subject to this act." The act also makes it unlawful for carriers to keep any accounts, records or memoranda not authorized by the commission. "Reading these provisions of the act," said Justice Day, "there is nothing to suggest that they were intended to include correspondence relating to the business of railroads. In recommending the passage of the act the commission did not suggest that it was essential to its purposes to have an inspection of the correspondence of railroads. . . . There is nothing from the beginning to the end of the section referred to," said Justice Day, "to indicate that Congress had in mind that it was making any provision concerning correspondence received or sent by railroad companies."

This suit grew out of an attack made on the floor of the Senate by Mr. Lea of Tennessee against the Louisville & Nashville. He charged that the road was issuing passes illegally.

Railway Officers

Executive, Financial, Legal and Accounting

Edward F. Kearney, who was recently appointed a receiver of the Wabash, has been elected president.

G. E. McCaughan, claims attorney for the Rock Island Lines, with headquarters at Chicago, has resigned, and the office has been abolished.

The office of J. M. Eedson, freight claim agent of the Toronto, Hamilton & Buffalo, has been removed from Detroit, Mich., to Hamilton, Ont.

W. P. Kenny, vice-president in charge of traffic of the Great Northern, has been elected president of the Great Northern Express Company, succeeding D. S. Elliott, resigned.

B. A. Worthington, formerly president of the Chicago & Alton, has been appointed receiver of the Cincinnati, Indianapolis & Western, which is a subsidiary of the Cincinnati, Hamilton & Dayton.

J. W. Orr, controller of the Pennsylvania Company and the Pittsburgh, Cincinnati, Chicago & St. Louis, with headquarters at Pittsburgh, Pa., has been appointed also auditor of the Cleveland, Akron & Cincinnati, the Waynesburg & Washington, the Wheeling Terminal, and the Pennsylvania Terminal, succeeding J. W. Renner, retired under the pension regulations.

Operating

Joseph B. Walsh, chief train despatcher of the Missouri, Kansas & Texas, at Sedalia, Mo., has been appointed trainmaster at Oklahoma City, Okla.

E. E. Hanna, formerly trainmaster of the Missouri, Kansas & Texas, at Smithville, Tex., has been appointed trainmaster of the St. Louis Southwestern at Waco, Tex.

W. M. Ansley has been appointed acting superintendent of the Second district of the Canadian Pacific, Alberta division, in place of F. Walker, superintendent at Lethbridge, Alta., who has been granted leave of absence.

B. B. Greer, assistant general manager of the Chicago, Burlington & Quincy for the lines east of the Missouri river, with office at Chicago, has been appointed assistant general manager of the lines west, with headquarters at Omaha, Neb., succeeding E. S. Koller, who has been appointed general manager of the Colorado & Southern. L. B. Allen, general superintendent of the Nebraska district of the Chicago, Burlington & Quincy, with office at Lincoln, Neb., succeeds Mr. Greer; W. F. Thiehoff, superintendent of the LaCrosse division at LaCrosse, Wis., succeeds Mr. Allen; E. Flynn, superintendent of the McCook division at McCook, Neb., succeeds Mr. Thiehoff; C. D. Peckenpaugh, superintendent of the Sheridan division at Sheridan, Wyo., succeeds Mr. Flynn; G. L. Griggs, superintendent of the Sterling division, at Sterling, Colo., succeeds Mr. Peckenpaugh, and W. G. Dungan, trainmaster at McCook, Neb., succeeds Mr. Griggs.

R. W. Stevens, who, as noted in last week's issue, has been appointed general superintendent of the Chicago & Western Indiana, with headquarters at Chicago, succeeding J. M. Warner, deceased, was born in 1869, at St. Stephen, New Brunswick. He was educated at the St. Stephen High School, and began his railway work as a brakeman on the Terre Haute & Peoria, now a part of the Vandalia, at Decatur, Ill., under Mr. Warner, who was then trainmaster. He then went to the Chicago & Western Indiana and the Belt Railway of Chicago, and after working successively as switchman and conductor, in 1895 was appointed yardmaster of those roads. In 1904 he was appointed general yardmaster, and while holding that position was also general supervisor of the outside working forces on track elevation in Chicago. In the fall of 1906 he was appointed trainmaster, and in 1909, superintendent, from which position he has now been promoted to general superintendent of the Chicago & Western Indiana, succeeding Mr. Warner, whose title was general manager.

Traffic

The headquarters of J. L. Harris, recently appointed general live stock agent of the Wabash, are at Kansas City, Mo.

H. D. Wilson has been appointed general agent of the passenger department of the Missouri Pacific and the St. Louis, Iron Mountain & Southern at Memphis, Tenn.

H. C. Dinkins, general agent for Latin America of the International & Great Northern, with headquarters at New Orleans, La., has been appointed foreign freight agent, with office at Houston, Tex.

The general freight and passenger departments of the Fort Worth & Denver City and the Wichita Valley will be consolidated on March 1, and will be placed in charge of W. F. Sterley, who will have the title of general freight and passenger agent, with headquarters at Fort Worth, Tex.

Elbert Blair has been appointed southwestern freight agent of the Chicago & Alton, at Dallas, Texas, in place of S. W. Myers, assigned to other duties. Barth Reidy has been appointed general agent traffic department at Little Rock, Ark., and F. W. Birchett has been appointed general agent traffic department at New Orleans, La.

Engineering and Rolling Stock

E. H. Morey, shop demonstrator and chief apprentice instructor, has been appointed foreman of the new erecting and machine shop of the Chicago & North Western, at Chicago, Ill. E. Bloom has been appointed shop demonstrator and chief apprentice instructor, succeeding Mr. Morey.

C. M. Newman has been appointed superintendent of shops of the Baltimore & Ohio Southwestern at Washington, Ind. A. E. McMillan, assistant master mechanic at Cincinnati, Ohio, has been appointed master mechanic of the Indiana and Illinois divisions, with headquarters at Washington, and W. H. Keller succeeds Mr. McMillan.

OBITUARY

George Carter McNally, superintendent of car service of the Elgin, Joliet & Eastern, died on February 22, at his home in Joliet, Ill., aged 51 years.

Railway Extension in Burma.—The first 65 miles of the Southern Shan States Railway have just been opened for traffic, and they bring Kalaw, the finest hill station in Burma, within 24 hours of Rangoon. Kalaw is 70 miles nearer Rangoon than Maymyo, and although, according to present arrangements, a journey will occupy about the same time, when the new line is in thorough working order it will be possible to reduce the *trajet* by several hours. Kalaw is about 1,000 ft. higher than Maymyo, and it has a proportionately cooler climate and a smaller rainfall. The mosquito, which infests Maymyo, is almost non-existent in Kalaw. The new extension comprises a high-level girder bridge at Yinmabin. Upon the main ghaut, 18 miles in length, there is a continuous ascent of 1 in 25, and it is considered the heaviest ascent in India. There are four reversing stations on the section, and the descent will be one requiring great care.—*Engineering*.

New Railway Routes for Neutral Commerce.—The commerce of the neutral countries is being so inconvenienced that the question of establishing new routes engages serious thought. Thus the export of Swedish timber via Norway has not worked quite so smoothly as could have been desired, and an export bureau has been formed. A block occurred on the Norwegian side, and for some days all despatch of Swedish timber via Norway had to be stopped. The Norwegian railway authorities then undertook to forward 60 cars daily; but this soon proved insufficient, and some 350 cars were allowed to accumulate north of Ostersund and on the Norwegian side. The export bureau referred to is to serve as an intermediary both between the Swedish shippers and the Swedish railway authorities, and between the latter and the Norwegian railways. If only sufficient Norwegian rolling-stock, especially engines, can be made available, the new route is expected to become one of great importance.

Equipment and Supplies

LOCOMOTIVE BUILDING

The Delaware, Lackawanna & Western is in the market for 5 locomotives.

The St. Louis Stock Yards have ordered one switching locomotive from the American Locomotive Company.

CAR BUILDING

The Boston & Maine is in the market for 3,000 underframes.

The Missouri, Kansas & Texas is in the market for 1,000 steel underframe and 200 all-steel 100,000 lb. capacity gondola cars.

The Siamese Government, it is reported, will receive bids until July 29 on 159 freight cars. This item has not been confirmed.

The Southern has given an order to the Lenoir Car Works to repair 500 box cars and equip them with steel underframes.

The Russian Government is reported to be inquiring for prices on 50,000 pairs of axles and wheels, 30,000 to 60,000 tires, 30,000 rough axles and 10,000 rough wheels. This item has not been confirmed.

The Chicago, Burlington & Quincy has ordered 2,500 center sills from the American Car & Foundry Company, and 1,200 box and 300 stock cars from the Haskell & Barker Car Company. The cars will be 40 ft. long; they will be of 80,000 lb. capacity, and will be provided with steel center sills.

Railway to Moorish Coast.—It is reported that the section of the railway to Mekinez has been completed, thus uniting Fez with Rabat, on the coast.

Railway Connections Between Russia and Sweden.—Although the Stockholm-Raumö (Finland) route, which has been closed since three Swedish steamers were blown up by German mines, was resumed a day or two before the new year, the Russian authorities appear very anxious to establish a connection by railway between the Russian and the Swedish systems. For this purpose the Russian railway has been pushed on as rapidly as possible as far as Karungi; but the line is only of a temporary nature, and Russian statements about connection to be made between this line and the Swedish railways are being officially contradicted in Stockholm. The Swedish department in question is of opinion that should a Swedish-Russian railway connection some day be established, a plan which the Swedish authorities have never encouraged, it would have to be effected south of Hapavanda, and not at Karungi. The Swedish line from Hapavanda to Karungi is not expected to be ready until the latter part of 1915. Of the Russo-Finnish-Norwegian-Swedish traffic conference, to which leading Russian papers have referred to as about to be held, nothing is known in Sweden.

Electrification of the Italian Railways.—The electrification of the Italian State Railways is progressing steadily, if slowly. It is controlled mainly by the available funds in the hands of the Railway Administrator in each financial year. The progress of the works is shown by the yearly expenditure since 1907. In the three years from 1907 to 1910 the expenditure was $617,000. In the working year 1910-11, $757,000; 1911-12, $960,000, and in 1912-13, about $1,400,000. There was also allotted in 1912-13 for electric traction permanent plants about $2,600,000, besides a sum of about $200,000 for other works. This contrasts with $845,000 allotted in 1911-12. On June 30, 1913, the extent of the transmission lines amounted to nearly 480 miles. The sub-stations numbered 30. Electric operation has worked regularly on the Turin-Modane line, on the old lines of the Giovi, on the Milan-Marese section, and on the Valtellina lines, and a regular electric service of passenger and goods trains has been started on the Savona-S. Giuseppe-Ceva section. There now remains the electrification of the branches of the Giovi, the Lecco-Monza and the Turin-Pinerolo lines.—*The Engineer*

Supply Trade News

William F. Gurley, of the firm of W. & L. E. Gurley, Troy, N. Y., died at Atlantic City on Wednesday, February 17.

Wellington B. Lee has been appointed vice-president of the Track Specialties Company, Inc., New York, effective February 1.

Jed O. Gould, general superintendent and works manager of the Gould Coupler Company, at Depew, N. Y., died Friday, February 19, at Buffalo, N. Y.

George T. Merwin, formerly with the W. W. Butler Company, Ltd., Montreal, Que., has been appointed general sales manager of the Canadian Car & Foundry Company, Montreal.

The Zug Iron & Steel Company, Pittsburgh, Pa., has been acquired by Jos. T. Ryerson & Son, Chicago. The plant is to be dismantled and a warehouse will be erected on the site.

George Gibson Barret, formerly general manager of the Cleveland Drop Forge Company, and at one time connected with the American Locomotive Company, died at his home in Commack, L. I., on Thursday last.

C. W. Rhoades has been appointed western railway representative of the Kay & Ess Company, Dayton, Ohio. In the announcement to this effect, made in the *Railway Age Gazette* of last week, his name was incorrectly spelled.

John H. Trent, formerly railroad representative of the H. W. Johns-Manville Company, New York, at St. Louis, Mo., has been transferred to New Orleans, La., as branch manager, and has been succeeded at St. Louis by W. B. Mallette.

The Lea-Courtenay Company, which has hitherto been represented in Chicago territory by the Maher & Byrne Company, has recently established a branch office of its own in the Conway building. Mr. Maher has resigned from the Maher & Byrne Company, and has been appointed Chicago manager of the Lee-Courtenay Company.

J. B. N. Cardoza & Company, Inc., Citizens Bank building, Norfolk, Va., have been appointed southern representatives for the Track Specialties Company, Inc., New York. The officers of J. B. N. Cardoza & Co., are as follows: J. B. N. Cardoza, president; Edmund R. Cardoza, vice-president; Thomas A. Carroll, treasurer, and Joseph L. Young, Jr., secretary.

H. Ward Leonard, president of the Ward Leonard Electric Company, Bronxville, N. Y., died suddenly of apoplexy, as he was about to attend a banquet of the American Institute of Electrical Engineers at the Hotel Astor, New York, on Thursday, February 18. Mr. Leonard was a prominent electrical engineer and inventor. He was born in Cincinnati on February 8, 1861. He graduated from the Massachusetts Institute of Technology, and when he was 23 years of age became associated with Thomas A. Edison as a member of Mr. Edison's staff of four engineers selected to introduce the Edison Central Station System. When he was 26 years of age he became general superintendent of the Western Electric Light Company at Chicago. The following year he formed the firm of Leonard & Izard, which made many important installations of central stations and electric railways. In 1889, when the firm was bought out by the Edison interests, Mr. Leonard became general manager of the combined Edison interests for the United States and Canada, with headquarters in New York. In 1891 he completed his inventions of the Ward Leonard system of motor control, and later introduced several other important inventions in the electrical field.

TRADE PUBLICATIONS

AUTOMATIC TELEPHONES.—The Automatic Electric Company, Chicago, has recently issued a 24-page folder in which are reproduced many of its advertisements as they appeared in the *Railway Age Gazette*, with special attention directed to such features as are particularly adapted to railroad requirements.

Railway Construction

ARKANSAS, LOUISIANA & GULF.—This road, which on December 1, 1914, was consolidated with the Ashley, Drew & Northern, and which now operates between Monroe, La., and Monticello, Ark., a distance of 102 miles, will be extended north to Pine Bluff, Ark. However, it has not been definitely decided when actual construction work will begin.

ATCHISON, TOPEKA & SANTA FE.—The extension from Exeter, Cal., to Lindsay, a distance of 10 miles, has been authorized, and bids for the construction work are now being asked.

BLACK MOUNTAIN & EASTERN.—This railroad, which is being built by the J. H. Phipps Lumber Company of Fayetteville, Ark., will extend from Cass, Ark., to Combs, connecting with the St. Louis & San Francisco at that point. The line will be 16 miles long, all of which has been graded and steel has been laid on 13 miles. One small frame bridge remains to be built.

BRITISH COLUMBIA & WHITE RIVER.—Application is being made to the Canadian parliament for an extension of time in which to build from Bear creek, at the mouth of the Chilkat river, B. C., northwest to White river, thence to the boundary between the Yukon territory and Alaska. The company was incorporated in 1911. C. M. Marpole, G. E. MacDonald, G. E. Wilson, A. McDonnell and J. Ironside are the provisional directors.

BURLINGTON, MISSISSIPPI RIVER & EASTERN.—A new steam road is being proposed by this company to extend from Keithsburg, Ill., to a point opposite Muscatine, Ia., then in an easterly direction to Cambridge and Kewanee, Ill., connecting with the Chicago division of the Chicago, Burlington & Quincy. It is estimated that 1,600,000 cu. yd. of earth will have to be moved, for which contracts will be let about May 1, 1915. There will be four bridges, varying in length from 50 to 250 ft. These will be concrete arches. The commodities carried will be stock, grain, coal, passengers, etc. M. J. Healy, Joy, Ill., is president and chief engineer.

CANADA WESTERN.—This company has asked the Canadian parliament for an extension of time in which to build from the international boundary in Alberta via Pincher creek and Cowley, and along the Old Man river to the Livingstone mountains, thence to Calgary, with a branch from Livingstone mountains to Michel, B. C. The company was incorporated in 1909, and the provisional directors were J. S. Hough, A. S. Kildall, L. L. Metcalfe, H. J. Box and O. L. Boynton, Winnipeg, Man.

CHICAGO, MILWAUKEE & ST. PAUL.—The grade separation work on the Bloomingdale road branch which extends from Pacific Junction to Chicago & Evanston Junction is now being completed.

FLORIDA ROADS.—The Port Commission of Jacksonville, Fla., is building a line to connect the various railroads within the city limits of Jacksonville. Work has been started and some contracts are to be let in the near future. The improvements consist of two filled wharves 1,000 ft. x 260 ft., an interchange yard, storage and sorting yard, necessary warehouses, cotton compress and storage, and facilities for handling general commodities. It is a terminal proposition, not a railroad. The commodities to be handled include lumber, naval stores, cotton, fertilizers, phosphate and general merchandise. Montgomery Corse, chairman, and F. W. Bruce, chief engineer. (November 13, p. 924.)

GEORGIA ROADS.—Surveys are now being made, it is said, for a line to be built from Jacksonville, Ga., northeast to Lumber City, about 20 miles. An old lumber line extending about half the distance between these two places is to form part of the new line. C. F. Smith, president of the Ocmulgee River Lumber Company, is back of the project.

MEMPHIS, DALLAS & GULF.—It is expected that the laying of steel on the 16½ mile section just north of Murfreesboro, Ark., will be completed by March 17, 1915. This will complete the line from Murfreesboro, Ark., to Hot Springs.

MINNEAPOLIS & ST. LOUIS.—This company is considering the

grading and the laying of a few short storage tracks on its property near First street, Minneapolis, Minn.

OCILLA SOUTHERN.—This company, which operates a line from Nashville, Ga., north to Rochelle, 62.3 miles, has given a contract to Martin Tankersley to build an extension from Rochelle northwest to Pope City, 7.3 miles, and this work is now underway. The company projected an extension some time ago from Rochelle north to Macon, about 80 miles, and it is probable that trackage and lease arrangements will be made in the near future with other lines north of Pope City. (February 5, p. 251.)

RADFORD-WILLIS SOUTHERN.—Organized in Virginia with $300,000 capital to build from Radford, Va., southeast along Little river and Indian creek to Willis, about 25 miles. C. W. Simpson will be in charge of the location survey. J. L. Vaughan, president, and W. L. Castle, secretary and assistant treasurer.

RAILWAY STRUCTURES

CHICAGO, ILL.—The Chicago city council last week passed the ordinance permitting the Baltimore & Ohio to move its coach yard from Harrison street, on the site which is to be occupied by the Pennsylvania lines freight terminal, to the vicinity of Sixteenth street and Western avenue, and this enabled work to be started at once preliminary to the erection of the Pennsylvania freight terminal between Canal street and the Chicago river, south of Polk street. Work was begun on the erection of a temporary freight house for the Pennsylvania Lines between Polk and Taylor streets, and this will be followed by the work of tearing down old buildings.

A grant has been obtained from the city council, giving permission to build a new coach yard and engine terminal on the Baltimore & Ohio Chicago Terminal property between Lincoln and Wood streets, near Fourteenth street. Work is already in progress on the filling in for the coach yards. The entire improvement will include a yard with a capacity of 300 cars, a storehouse two or more stories high, and 600 ft. long, a 34-stall engine house having a depth of 90 to 100 ft., whose exterior walls will be located on the lines of Fourteenth and Lincoln streets, forming a right angle instead of the usual circular form, a 100-ft. turntable, and necessary ash and coaling facilities, inspection pit and washout platform. Adjacent to, and partially within the engine house will be a machine and blacksmith shop and tool room. All buildings will be of modern construction. Additional tracks will be laid between Union and Western avenues, which will require considerable bridge and grading work. Plans, which will be completed some time during March, are being prepared by M. A. Long, assistant to Chief Engineer F. L. Stuart.

HARRISBURGH, PA.—The Cumberland Valley is asking for bids until March 17, for the construction of the modern arch bridge, to be built over the Susquehanna river at Harrisburgh to replace the present steel deck truss bridge. The new bridge is to carry two tracks; it will have 46 spans and will be 4,000 ft. long. (January 22, p. 171.)

KANSAS CITY, MO.—The Chicago & Alton is contemplating the building of a 250,000 bu. grain elevator at this point. It is planned to start work some time in March. The estimated cost is $100,000.

PHILADELPHIA, PA.—Bids were asked for recently by M. L. Cooke, director of the Department of Public Works, Philadelphia, for building a reinforced concrete bridge to carry Broad street over the tracks of the Pennsylvania Railroad, the Baltimore & Ohio and the Philadelphia Belt Line. The proposed structure is to consist of three spans of 35 ft. each, and the greatest height will be 25 ft., with 21 ft. clearance. The city of Philadelphia is to pay 40 per cent of the cost of this bridge, the Pennsylvania Railroad 30 per cent, and the Baltimore & Ohio 30 per cent.

RAHWAY, N. J.—The Pennsylvania Railroad has given a contract to F. A. Havens & Co., Philadelphia, Pa., for building a shelter shed to be 230 ft. long, and a concrete platform to be 20 ft. by 900 ft., at Rahway. There will also be a small waiting room, a baggage elevator and a stairway connecting with the passenger tunnel. It is estimated that these improvements will cost about $25,000. This is part of the track elevation work now being carried out at Rahway.

Railway Financial News

BIRMINGHAM, ENSLEY & BESSEMER.—Augustus Benners, a lawyer of Birmingham, Ala., has been appointed a co-receiver of the Birmingham, Ensley & Bessemer, representing the interests of the independent bondholders' committee.

CENTRAL NEW ENGLAND.—See New York, New Haven & Hartford.

CINCINNATI, INDIANAPOLIS & WESTERN.—B. A. Worthington, formerly president of the Chicago & Alton, has been appointed receiver of the Cincinnati, Indianapolis & Western, a subsidiary of the Cincinnati, Hamilton & Dayton.

DES MOINES & FT. DODGE.—See Minneapolis & St. Louis.

LOUISVILLE & NASHVILLE.—J. P. Morgan & Co., New York, have bought from the Louisville & Nashville $7,500,000 first mortgage 5 per cent Lexington & Eastern bonds. The bonds are guaranteed principal and interest by the Louisville & Nashville. The Lexington & Eastern is a line built into the eastern Kentucky coal fields of the Consolidation Coal Company.

MAINE CENTRAL.—A bill has been introduced in the Maine legislature authorizing the Maine Central to retire $10,000,000 of its capital stock and to issue 5 per cent preferred stock to raise funds for retiring the $10,000,000 stock. This $10,000,000 stock is held by the trustees of the Maine Railways Company.

MINNEAPOLIS & ST. LOUIS.—Stockholders of the Minneapolis & St. Louis and the Des Moines & Ft. Dodge have approved of the merger of these two companies under an agreement modified somewhat from the earlier one under which the merger had first been planned.

NEW YORK CENTRAL RAILROAD.—Judge Hough, in the United States district court, has granted a preliminary injunction preventing the merger of the New York & Harlem and the New York Central Railroad pending the outcome of the suit brought by John Scott Boyd, Jr., and other minority stockholders of the Harlem to stop the merger. The injunction was granted after the plaintiffs had agreed to drop the allegations of violation of the Sherman law and to confine their suit to the civil points involved.

NEW YORK & HARLEM.—See New York Central Railroad.

NEW YORK, NEW HAVEN & HARTFORD.—Further details of the statement made by the directors to the Massachusetts Public Service Commission in regard to their plans for the dissolution of the New Haven system include a proposal to sell outright the real estate along the line of the New York, Westchester & Boston, having a book value of $3,799,000, and the sale of $13,709,000 notes of the New England Investment & Security Company. The New Haven proposes to retain the New York, Westchester & Boston and to retain control of the New York, Ontario & Western and the Central New England, the latter to be continued in operation as part of the New York, New Haven & Hartford.

NEW YORK, ONTARIO & WESTERN.—See New York, New Haven & Hartford.

NEW YORK, WESTCHESTER & BOSTON.—See New York, New Haven & Hartford.

RAILWAYMEN'S GIFT TO THE KAISER.—It is reported that the railway employees in Germany have offered the sum of $60,000 to the Kaiser as a birthday present. The German Emperor expressed his thanks to Dr. von Breitenbach, the Minister of Public Works.

RAILWAY EXTENSIONS IN RUSSIA.—The Russian Ministry of Ways of Communication has decided to raise the question of building a railway from the ice-free port of Kem, on the White Sea, to Petrozavodsk, the chief town of the Olonets government. Should this project be realized, Kem will be connected with the entire railway system of the Empire, as from Petrozavodsk to the station Zwanka, on the northern line, a double-track private railway is already in course of construction.